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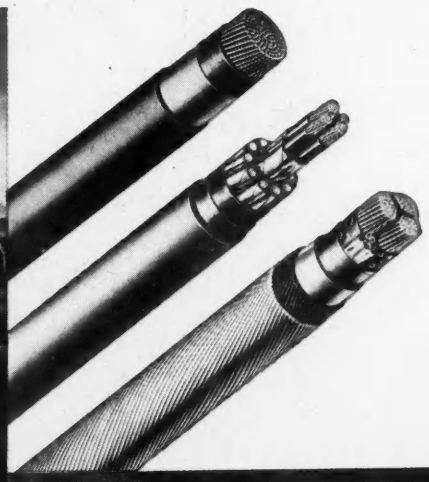

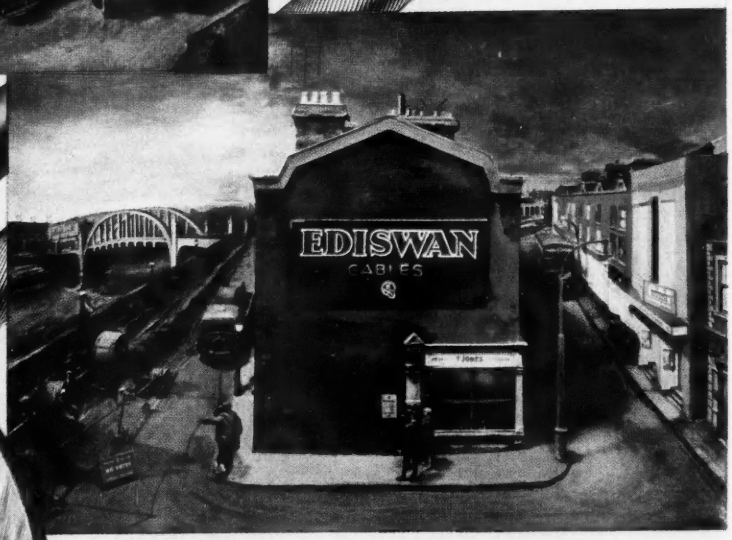

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26 OCTOBER 1956

In This Issue

743 DOMESTIC ELECTRICITY
745 FINNISH HOME LIFE
747 DOMESTIC DEVELOPMENT IN NORWAY
749 WESTERN GERMAN IDEAS
751 LOW COUNTRIES AND DENMARK
753 AUTOMATIC GREENHOUSE OF THE FUTURE
754 THE QUEEN OPENS CALDER HALL
755 DOMESTIC ELECTRICAL EQUIPMENT SURVEY
781 DOMESTIC APPLIANCES AND THEIR MAKERS
786 ELECTRICITY DISTRIBUTION PRACTICE
787 VIEWS ON THE NEWS
788 OVERSEAS ELECTRICAL TRADE
790 PERSONAL AND SOCIAL
793 INDUSTRIAL NEWS
797 LETTERS TO THE EDITOR
798 THE MOTOR SHOW
799 AGREED PRICES
800 FINANCIAL SECTION
803 GENERATION AND DEVELOPMENT
804 NEW PATENTS
805 NEXT WEEK'S EVENTS
806 CONTRACT INFORMATION

143 *CLASSIFIED ADVERTISEMENTS*
154 *INDEX TO ADVERTISERS*

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ELECTRICAL REVIEW

26 October 1956 Vol. 159 No. 17 Established 1872

Domestic Electricity

A FURTHER advance in the amount of electricity supplied for domestic purposes was announced by the Central Electricity Authority in its 1955–56 report. In fact the proportional increase over the preceding year's figure (11·0 per cent) was greater than the rise in industrial supplies (8·8 per cent); farm supplies (presumably including a domestic element) showed an even larger increase—11·7 per cent. As the percentage increase in domestic supplies was greater than the rise in the number of domestic consumers (3·3 per cent) it is evident that the advance was intensive rather than extensive, as it was in the preceding year. It is noteworthy that the rise in domestic sales has been about the same in the past two years; it was only 2·9 per cent in 1953–54 when the number of new domestic consumers increased by 4·0 per cent.

As we pointed out last week, the Central Electricity Authority has stated that in general there was a decline in the sales of domestic appliances in 1955–56, although refrigerators and water heaters were disposed of in greater quantities. Upon the whole it would seem as though the effects of the restrictive policy adopted by the Government have not proved so severe as was feared. The reason, of course, is that in this day and age people insist on the most modern and convenient means of performing the many household tasks. But it is also a reasonable assumption that without restrictions the progress of domestic electrification would be even greater.

We suppose that in the present state of the country's economy some restrictions are inevitable but there are good arguments against applying them in this direction. It appears to be thought in some circles that domestic electricity has a future to be lived down. It is a comparative newcomer to the home and merely a substitute for other agents which are regarded as satisfactory enough. Solid fuel (if burned in certain types of grate) is extolled and the scarcity of suitable fuel and its limitations are overlooked. It is conceded that electricity is essential for lighting and for the operation of radio and television sets, but it is contended that its use should be confined to these rather (from the national point of view) unremunerative limits.

We refuse to accept such limitations, believing that the people want electricity and are not wrong in this. For that reason we will continue to advocate its ever-increasing use in the home. That is the purpose of our regularly-published appliance surveys and of this annual domestic number in which the whole field of electricity in the home is reviewed.

FAIR RETURNS

It is perhaps a natural assumption that when manufacturers get together to fix prices they are " ganging up " on the consumer. But things are not always what they seem and it is possible that the ultimate good of the community is best served in this way. Too often the cutting of prices implies the lowering of standards of quality, operation and safety: the cheapest is seldom the best. It is a fair deduction from this that price maintenance can be justified only by the maintenance of these standards. The manufacturers of heavy electrical equipment claim that their price agreements have this justification and at a meeting last week their case was put with some vigour. A statement was presented showing how difficult it is to fix an average rate of profit for individual firms and it is held that only the average industry profit is of any public significance.

If standards are to be maintained it is necessary to spend money on research, development, education and training and the consumer cannot complain if he is asked to bear the cost when he is the beneficiary. Therefore funds for these purposes must be ensured by prices which take account of the expenditure. Again, the capital employed must secure a fair return, for nobody will provide money for nothing. It is only by concerted action that fair prices can be fixed in such an industry as that of heavy electrical plant manufacture. If prices do not bear some relation to the overall costs of industry, if individual concerns indulge in price-cutting to secure a temporary advantage, the result will be a reversion to the " jungle law " which once prevailed in the industry and the buyer as well as the seller will be the sufferer.

LOWER GRADE STEELS

In his inaugural address to the I.E.E. Utilisation Section (*Electrical Review*, 12th October, page 659) Mr. H. J. Gibson made a casual reference to the tendency of the electric arc furnace to supersede the open hearth furnace in the production of lower grade steels. It was a little startling to read this in such a context for the subject dealt with particularly was balanced load development.

We were surprised because we have been led to believe during the last three or four years that, so far as this country is concerned, the use of the electric arc furnace in place of the open hearth furnace had not developed on a scale large enough for it to be called a trend. This impression has been gained from the great difficulty we have had to persuade steel manufacturing men to write for us since the publication of the report by the Battelle Institute of the United States dealing with the trend in that country. Even so, we obtained from the few articles which we were able to publish on the subject little encouragement to believe that there had been any real advance in the use of the electric arc furnace for the production of lower grade steels.

Little imagination is necessary to show what far-reaching effects such development would have upon the supply of electricity and on the production of electric arc furnaces and ancillary equipment once the idea has been accepted by the electrical mind.

TROLLEY-BUSES PREFERRED

Mainly because it is argued that the motor-bus is a more " flexible " form of transport than the trolley-bus, some transport authorities, led by London, have recently announced their intention to abandon their trolley-bus services, despite public opposition and the fact that electric traction has outstanding merits to offset the operational disadvantage.

One of these undertakings is that at Portsmouth. We hope, however, that a recent address to the local centre of the Institute of Traffic Administration by Mr. C. T. Humpidge, general manager of the Bradford City Transport Department, will lead to the reconsideration of this policy. Mr. Humpidge advised all local authorities to think twice before scrapping their electric traction services. The cost of running motor-buses, he said, was likely to rise, whereas the cost of operating trolley-buses would probably decrease in view of Britain's atomic energy programme, and there was every chance that transport authorities would want to re-introduce trolley-buses in the future. He pointed out that during the time he had been at Bradford the trolley-buses had made a profit every year while the motor-buses had made a loss every year. In his opinion anyone could make trolley-buses run cheaper than motor-buses; for one thing they lasted much longer.

COAL PRODUCTION

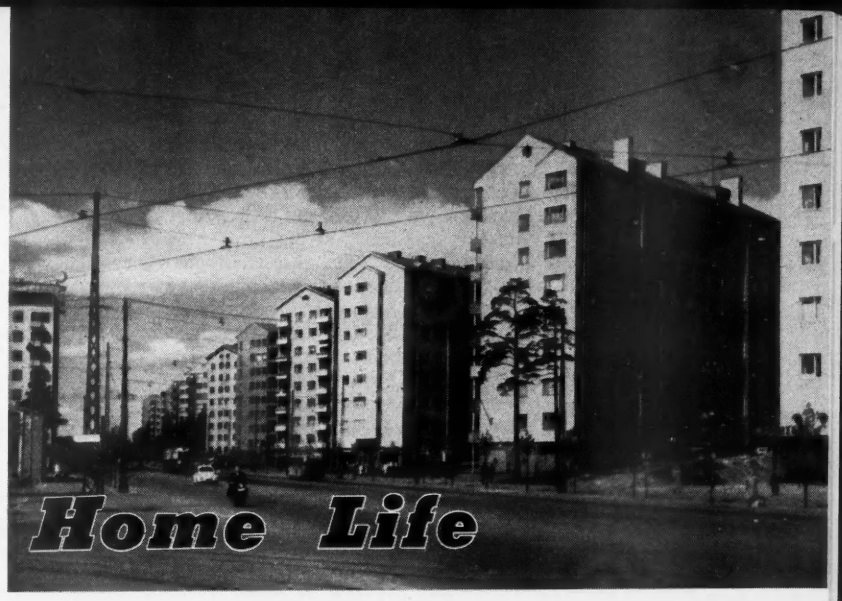
It was reported recently that despite a decrease in the number of men employed in deep coal mining during the first thirty-seven weeks of the current year there was a slight increase in production. This is heartening because we have felt all along that despite repeated decreases in annual production since nationalisation the colossal schemes of colliery electrification would eventually bear fruit. In commenting on the report of the National Coal Board (" Investing in Coal ") earlier in the year we criticised the tendency in some quarters to stigmatise the report as an attempt to excuse the failure of the forecast " Plan for Coal," published five years earlier by the Board. Many millions of pounds have been spent since " Plan for Coal " was launched, but now instead of the then-forecast production of 240 million tons of coal a year in 1961 to 1965, the revised plan gives a figure of 228 million tons for 1960 and 240 million tons for 1965. We think that it should be pointed out that the greater part of the expenditure has so far been devoted to sinking shafts and boring tunnels which are not yet contributing to production.

LOW TEMPERATURE HEATERS

Continuing our series of illustrated surveys of domestic electrical appliances, next week (2nd November) we shall be dealing with low temperature heaters. Included in the particulars to be given in tabular form will be details of the type, size, loading, method of control, casing, finish, price, purchase tax, etc. On 16th November thermal-storage water heaters will be reviewed

NOTEWORTHY DIFFERENCES IN ELECTRICAL USES SEEN IN FINLAND

By
Mary J. Cumming



Finnish Home Life

MY sojourn in Finland in 1954 proved to me that in the matter of domestic electrification that country was very different from others.

War losses contributed to a shortage of power which had to be overcome in order to speed Finland's economic recovery. New generating stations were required but private companies were financially unable to meet this urgent post-war demand. Financial assistance was given by the Government which then became the largest owner in concerns having private companies and individuals for their other shareholders. These new companies are responsible for the generation of electricity and for its transmission from the north to the south of Finland. Power is then supplied by the smaller companies who largely own the country's distribution network.

The voltage is transformed from 220 kV to 20 kV and then to 380/220 V in the rural areas. In Helsinki it is stepped down from 20 kV to 5 kV and finally to 380/220 V. Alternating current is used throughout the entire country, except for Helsinki where a little d.c. still remains.

Miss Cumming was the holder of the 1954 Caroline Haslett Trust Travelling Exhibition. She is senior demonstrator, Clyde Area, South of Scotland Electricity Board

Earthing appears to be a difficulty in Finland. I was told that Finnish soil is not a good conductor because much rock formed in the Ice Age is still present. One was reminded daily of the safety regulations laid down by an Electrical Inspectorate formed some 25 years ago. It is responsible to a board of directors upon which the State and private enterprise are equally represented. The Inspectorate is empowered by the Ministry of Industry to prepare and issue new safety regulations from time to time. In addition it has the power to test all equipment from the power station down to the home and to inspect any power station, overhead line or indoor installation, at any time in any part of the country. All appliances imported from Britain must conform to the regulations and be approved by the Inspectorate before being accepted.

The mention of appliances calls to mind the many differences in the design of domestic electrical equipment of Finnish manufacture. These differences were created chiefly by economic difficulties and a shortage of power, both of which affect every aspect of the electrical life of Finland. Cooker design is also affected, but manufacturers, encouraged by the steady increase in production from 1946-1954, were at the time of my visit producing cookers of a standard type. In these there is no splashplate and the hob carries three solid boiling plates and one radiant plate, all of which have a lower loading than plates of corresponding size in this country. By this means the total loading is kept down to 5 kW, a reflection of the shortage of power. The solid boiling plates are annular with a circle about 1-1½in in diameter removed from the centre of the plate. A new type of solid boiling plate was being introduced from Germany. It may be described as a combination of both solid and radiant plates. It has all the properties of a radiant plate and does not retain its heat so long as our solid plates. I liked it because it seemed to ensure instant response to control. Three-heat switches control boiling plates; " Simmerstats " are seldom used for economic difficulties limit their import.

The boiling plates are raised above the hob plate and are thus protected from spillage. The hob is raised only when boiling plates require repair. There are no grill-boilers on Finnish cookers because grilling is seldom done in Finland, but there is a portable griller and grilling may be done in the oven by using the top element. There are no hot cupboards; Finnish meals for the most part are served cold. Ovens are smaller than ours, are thermostatically controlled, have top and bottom elements and are fitted with drop-down doors.

Cooker control units are not employed; the cooker cable simply emerges from under the skirting board. Consequently one 10 A earthed socket is always installed in the kitchen for the use of small appliances such as toasters, coffee kettles, mixer-beaters, grillers, waffle irons, portable cookers, irons and even small portable immersion elements.

Toasters are not often seen because white bread is used only occasionally; the typical Finnish loaf is flat and round and is made from rye or a mixture of rye and wheat. The coffee kettle is a percolator with a universal element. This again was different and in view of the fact that portable immersion elements were in common use, I asked why the universal element was used and was told that cleaning was much easier. Mixer-beaters are generally imported and were most popular with the country housewife, particularly for breadmaking. Our mixers, although superior for some things, are of little use for this purpose.

The climate has a great influence on the lives of the people. The first snows of winter fall in the north during October and gradually travel south until the whole country is under snow. The Finn knows when to seal up the

Title picture shows typical post-war flats in Helsinki

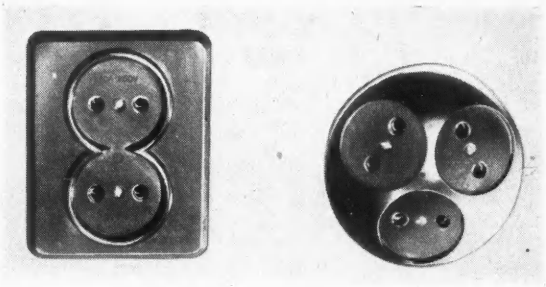
double windows in his home which in the city is centrally heated. In the country waste wood is plentiful and the home is heated by burning it in the timber cooker. Space heating by electricity is not encouraged and will not be until more power becomes available; tariffs have been designed to make it almost impossible. Electricity has been much used in the de-freezing of water pipes and many supply undertakings have had to train electricians in this consumer service because fire is the real danger.

The family wash accumulated during the month can usually be done to schedule. Finnish designers have produced machines to accommodate loads of about 15 lb. The washing is usually dried indoors in winter. The wet wash is wheeled in stainless steel trolley tubs from the washing machine to the drying room where heat is obtained from the central heating pipes which are encased at a particular point with an electric fan which causes the hot air to circulate. Electrically heated and electrically driven mangles, imported from Denmark, speed up the ironing.

All this equipment for communal use is housed in the basement premises and is jointly purchased by the flat dwellers who own their block or it may be provided for tenants in the rented blocks. The housewife in the private dwelling house has a choice of the imported pulsator or agitator type of washing machine as also has the flat dweller who wishes to use a machine in her own little flat. As the kitchens are small, the Electrical Inspectorate has given permission to the flat dweller to install an earthed 10 A socket in the bathroom but on condition that the socket is labelled "for washing machines only," is $3\frac{1}{2}$ft from the floor and out of reach of little fingers. The switch for the bathroom light is placed outside the door.

Temperatures below freezing point in winter solidify milk and cause loss of food values in other foodstuffs. The refrigerator set at a temperature above freezing point actually keeps foodstuffs "warm" and thereby preserves them. For this reason the refrigerator is more essential in winter than in summer. The basement premises of every block of flats have a large refrigeration section in which every housewife in the block can store enough food to tide the family over the long winter months. Familiar models imported under licence were often seen.

Finland is a land of forests and many homes have beautiful wooden floors which are much too attractive to cover with carpets. The Finnish housewife takes great pride in shining floors and linoleums which have to be polished, with the result that the demand for polishers is greater than in this country and greater than the demand for vacuum cleaners. Carpets are brightly coloured and are usually cleaned by washing.



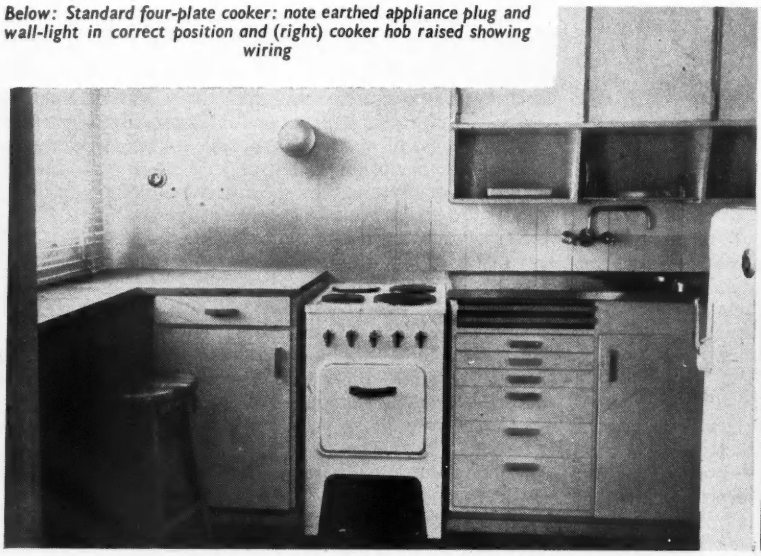
Two- and three-way unearthed sockets

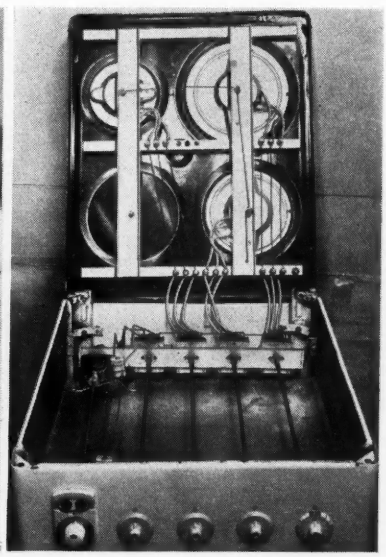
Vacuum cleaners and polishers can be connected to an unearthed 10 A socket in bedrooms and sitting rooms. Each room is fitted with two unearthed sockets according to the regulations laid down by the Electrical Inspectorate. One socket may be of the adaptor type thus accommodating one, two or three appliances. The Finnish housewife buys an "earthed" plug or an "unearthed" plug which seems a simple system compared with ours.

Finnish light fittings are most fascinating, most original and really very beautiful. Colour is used extensively but the emphasis is definitely on good lighting. Fittings are designed for durability and easy cleaning and they are reasonably priced.

Electricity plays a very important part in all aspects of school life. Boys are regarded as the electrical engineers of the future and are taught from a technical point of view. Girls, the future housewives, are trained in the domestic application of electricity from the age of twelve. I was very impressed by the fact that all electrical equipment in schools, e.g. cookers, washing machines, irons, sewing machines were right up to date. There were no instances, too common in this country, of girls having to work on 20-year-old cookers. The Finnish schoolgirl is delighted with her cooking by electricity, her confidence in electricity grows and her demand for more electricity will tell in the years to come.

Below: Standard four-plate cooker: note earthed appliance plug and wall-light in correct position and (right) cooker hob raised showing wiring

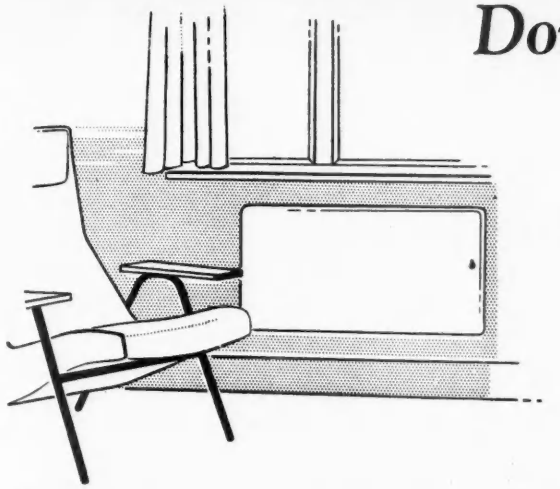




Domestic Development in Norway

Extensive Use of Electric Space Heating

By MURIEL MARRIS



Because of wooden construction of houses, panel heating, with three-heat switches or thermostats, are preferred to radiant fires

NORWAY, being a very mountainous country, has potentially great water-power resources. These have been harnessed to supply relatively cheap electricity for industrial, commercial and domestic use. Of the 125,000 square miles of land, 72 per cent is mountainous and glaciated, 24 per cent is forest, and the remaining 4 per cent tilled land. The population is only 3½ million; about half a million live in the Oslo area and the remainder in and around other towns scattered throughout the country. The rural population is not concentrated in villages, as in the majority of European countries, but is widely dispersed with families living for the most part in isolated farms. To supply electricity to everyone is no easy matter, but in 1952 at least 87 per cent of the homes had a regular supply and this figure has been greatly increased since then.

The people of Norway have been quick to realise the great advantages of electricity in the home, especially since all coal has to be imported. Wood is used to some extent for heating and cooking, but in the towns it is sometimes difficult to obtain and is very expensive.

Limitation of Demand

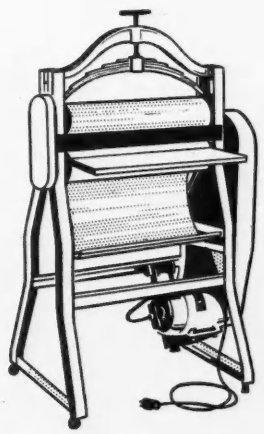
There are various tariff charges for electricity for domestic purposes, but they all contain a maximum demand feature designed to limit the simultaneous use of electrical appliances. Two examples may be quoted. In one, a fixed kW demand is agreed between consumer and supplier and this is charged at a fixed price per kW per annum. All energy consumed within that demand is charged at a purely nominal price; consumption in excess of the kW demand is separately metered and charged at a very much higher figure. In another tariff, the kW demand (which is very much lower than in the first example quoted) is charged at a higher price per kW, but units consumed within that demand are not metered and consumers may use as much as they wish. Energy consumed in excess of this low demand is, however, metered and charged at a fairly high price.

This type of tariff structure tends to make the housewife very electrically minded. With a little management and skilful timing in the use of her electrical appliances, she can obtain her electrical energy at a consistently low price, but without being in any way restricted to the number of appliances which she can have in her house. In consequence, most Norwegian housewives have far more electrical appliances to aid them in their daily work than have the housewives in this country. Indicators are normally installed to give warning when the demand is nearing the agreed limit.

Contrary to accepted British practice, nearly all heating appliances are fitted with a three-heat switch for control. This is particularly noticeable with the widely used electric storage water heaters. During the day the heater switch is set at "low" or "off" and turned up at night.

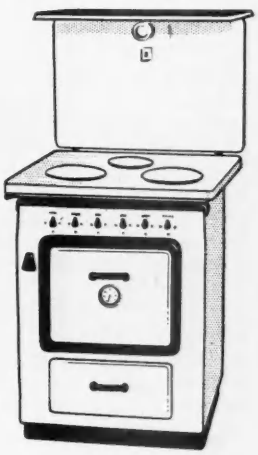
Electric space heating is used extensively, but conventional fires of the radiant type are not popular because of the possible danger in houses of wooden construction. Warmth is therefore normally provided by large panel heaters, fixed all round the walls of the room where possible, thus ensuring an even distribution. In many cases, once the heaters are switched on they are not switched off, day or night, throughout the whole winter. Heat control is obtained by means of three-heat switches used individually or in conjunction with air thermostats. Sometimes the whole of the heating of the house or flat is controlled by a master three-heat switch in addition to the individual switches on each panel. This enables the housewife to adjust the maximum demand, so as to keep it below peak, in a single operation.

To ensure that the electricity supplied for space heating is used at maximum efficiency, some supply authorities will not connect "all-electric" houses or flats unless they



In preference to hand-operated irons many Norwegian housewives employ this mangle-type presser in which the rollers are driven by a small motor

Normal Norwegian electric cooker with high splashplate embodying a switch and indicator lamp and three solid boiling plates



Miss Muriel Marris, holder of the eighth Caroline Haslett Trust Travelling Scholarship, is Senior Housecraft Adviser with the South Wales Electricity Board

are satisfied that adequate heat-insulating material has been used in the construction of the building.

Electricity is extensively used for cooking—in preference to other fuels. The actual amount of cooking, however, is not so great as in this country, which is possibly accounted for by the difference in the eating habits of the two countries. Norwegians have a light cold breakfast with coffee; the mid-day meal consists of open sandwiches or a very light meal, again with coffee; and dinner—the only cooked meal—is taken in the late afternoon or early evening.

The normal electric cooker is fitted with a high splash guard having a small light and switch at the top, and two or three solid hotplates. A grill is not usually incorporated and the oven is shallow by our standards. Some cookers have a warming drawer and many are leg mounted. Meat is sometimes roasted in the oven, but usually it is pot-roasted, with vegetables, on the hotplate. Potatoes are always boiled.

Laundry Equipment

In 1952, electric washing machines were becoming very popular and there were many makes and designs—British machines being well in evidence. Nearly all the larger models incorporated a heating element controlled by a three-heat switch. Many housewives filled the machine with water and soiled linen at night and switched the heater to the " low " position; in the morning the agitator was set in motion and the washing completed. The electric storage water heater supplied the hot water for the many rinses which the Norwegian housewife considers necessary for the perfect " white " wash.

One of the smaller Norwegian washing machines incorporated a novel device for removing the water from the clothes. In this, a metal container hooked on to the side of the machine contains a rubber bag into which the washed clothes are placed. A hose attachment is then fixed to the cold water tap and when this tap is turned on water flows into the container, between the bag and the outer casing. As the space between the container and the bag fills with water the resulting pressure compresses the rubber bag, squeezing out the soapy water from the clothes inside. This soapy water flows through a channel in the lid (which is clamped on the top) back into the washing machine. When maximum water pressure is reached, the cold water flows through an overflow pipe into the sink and the housewife then turns off the tap.

In many of the blocks of flats, laundry equipment is provided in the basement and is used by each tenant in turn. This means that the washing day is often restricted to once in three or four weeks according to the number of flats in a block.

I saw very few thermostatically controlled electric irons. Many housewives did not iron table or bed linen but merely pressed it by passing it several times between polished wooden rollers (which reminded me of the old-fashioned mangle!). These rollers were turned by hand or by an electric motor.

As Norwegian homes are rarely fitted with large carpets —rugs and mats being more popular—the cylinder type of electric cleaner is used, and one rarely sees the upright model.

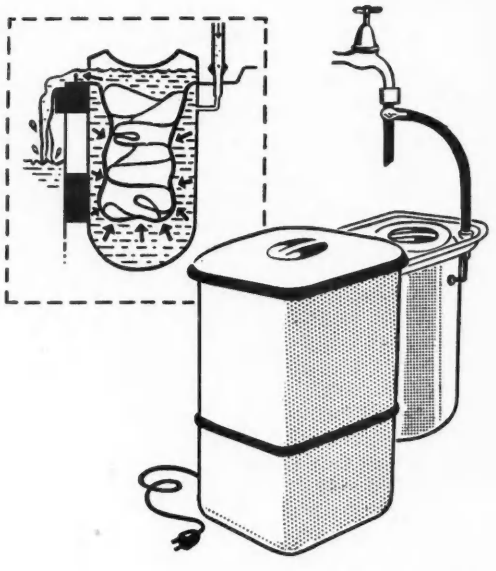
Refrigeration is used extensively in restaurants, hotels and on the larger farms. Many have deep-freeze plants with cold storage rooms at varying temperatures. Owing to climatic conditions—very cold and with heavy snow in winter—it is necessary to preserve and freeze as much fresh food as possible whilst it is available in the summer months. The town dweller, in 1952, was certainly interested in the smaller type of domestic refrigerator, but was rather loath to purchase owing to the high cost.

Advanced Lighting Method

Lighting in the home was far in advance of anything in this country. There were lighting fittings everywhere and great thought had been given to each one to obtain the best decorative effect and lighting value. In the evening it was interesting to walk round the blocks of flats and houses just to look into each living room and count the number of lighting fittings. Curtains are never drawn and one could see as many as four, five, six or eight lights burning. The single ceiling pendant, even in a bedroom or kitchen, is a thing of the past. Perhaps that accounts for the large number of electrical shops concentrating solely upon impressive displays of electric lighting fittings, table and floor standards and shades of all shapes, sizes and descriptions.

Because of the great rise in the demand for electricity since the war there is strict rationing at times, particularly in winter when the water supply to some of the power stations becomes frozen. To counteract this and to achieve an even greater degree of electrification, interconnection of all power plants via a main grid system is planned and has been partly achieved, but it all takes time and money. Eventually, the Norwegians hope to supply up to 95-98 per cent of all farms and household dwellings—a great achievement in a country with such difficult terrain.

My visit convinced me that the Norwegian housewife is particularly aware of the benefits that electricity can confer. Her British counterpart could well take a leaf out of her book.



This washing machine has a novel attachment for removing the water from washed clothes

WESTERN GERMAN IDEAS

Electricity in the Home and on the Farm

By JOAN SHARP

Miss Joan Sharp was the ninth holder of the Caroline Haslett Trust travelling exhibition

THE dominating impression received by any visitor to Western Germany must be the speed with which they are recovering from the effects of war. Reconstruction programmes are being pushed forward with high speed and boundless energy. Most of the people one meets reveal a determination to restore their personal lives and living conditions to the standards which they enjoyed before. It is obvious that a people so technically skilled as the Germans will not have overlooked the tremendous aid which electricity can give to such efforts, and whilst making every use of this great power in a drive to restore their individual and national prestige, they certainly have not overlooked the benefits and blessings which it brings to the housewife.

In Germany electricity is mainly supplied by companies, distribution being by overhead lines in the rural areas and by underground cables in the towns. Some d.c. supplies remain, but they are being changed over to a.c. quite rapidly. Low-voltage a.c. supply is at 220/380 V, 50 c/s. I found during my visit that the Hessische Elektrizitäts A.G. (H.E.A.G.) in Darmstadt was experiencing severe competition from the local gas undertaking. At Oldenburg the Weser Ems Company provides both gas and water supplies in its area as well as electricity.

Kitchen for students at the H.E.A.G. establishment, Darmstadt

Domestic tariffs are based on a fixed charge per room plus a running charge per unit. Employees of the companies are given concessionary terms for energy used in their homes, paying only the unit charge. Off-peak tariffs are available for water heating and the preparation of animal feeding stuffs and in some cases to factories.

To give an idea of the price of electricity I may quote the domestic tariffs of the two companies which I have mentioned. The Weser Ems Co. had a standing charge of 85 pf. (1s 5d) per month for each room and there was a meter charge of the same amount. For electricity consumed during the day the rate was 10 pf. (2d) per kWh and the night rate (with time-switch metering) was 7 pf. (just under 1½d) per kWh. The company's employees did not pay the room charge and received their electricity at 7 pf./kWh plus the meter rent.

The monthly room charges imposed by the H.E.A.G. were as follows:—One room, 1·60 Dm (2s 6d); two rooms, 2 Dm (3s 4d); three rooms, 2·5 Dm (4s 2d); four rooms, 3·15 Dm (5s 5d); five rooms, 4 Dm (6s 8d); six rooms, 5 Dm (8s 4d); and each additional room 1 Dm (1s 8d). The day tariff was 8 pf. (just under 3d) per kWh and the night rate 5 pf. (1d). Employees were allowed electricity at half the normal price.

I was impressed by the scale of use of electricity in flats. Flat dwellings have, of course, always been popular in Germany and huge blocks were being built at a most remarkable speed when I was there. Work often proceeded into the night with the aid of powerful electric floodlights. Central heating by means of a stove in the basement using coke or wood was widely adopted, along with double windows and shutters to keep out the cold.

In a block of municipal flats in Frankfurt-am-Main built specially for women and women with children, electric cookers and water heaters were installed in some flats—although the majority were using gas for these purposes. One very noticeable feature was the great number of lighting points, wall fittings and table lamps being used to a much greater extent than in this country. The fittings themselves were most attractively designed and were often made of washable plastic materials.

I was able to examine domestic appliances against several backgrounds, e.g. in homes, schools, factories and during tests. Electric cookers, I found were generally of attractive design and normally finished in black and white. Grills and splashplates were not provided and solid plates appeared to be used almost exclusively. The hob was more extensively employed in the preparation of meals than is the case in this country. Heavy flat-based pans were recommended and generally used. The ovens were deeper and narrower than ours whilst the elements were slipped in from the back and differed in design from those used in British cookers; frequently, separate switches were used for "Under" and "Over" heat, but thermostats were being progressively introduced. Oven ventilators were usually hand controlled.

At the Roeder factory where electric, gas and solid fuel cookers are manufactured, I found that electric cookers in process of assembly were lagged with crumpled aluminium foil. Here also they manufacture combination cooking ranges which are popular in country areas and permit the housewife to use solid fuel and electricity or gas at her

The experimental kitchen of the Weser Ems Company, Oldenburg

convenience, the solid fuel stove generally being used for space heating during the winter months when the appliance is in use.

The German housewife takes an intense pride in clean washing, but the housing situation has forced many of them to send out their laundry. Launderettes use machines which are similar in operation to those in use in this country.

In the home, and especially in the farmhouse, the "Rota" washer seemed to be most widely used. The design and action of this washer, I found, was different from any in use in this country for domestic purposes, being similar to the heavy duty laundry reciprocating drum washer, except that it operates in a vertical plane. It takes 15 lb of washing and holds seven gallons of water, providing heated rinsing water in addition to heating the washing water; the loading is 6 kW. I thought that its appearance was rather clumsy as it was often constructed of galvanised metal, though enamelled models were available. Many of the German washers had water heating elements.

In one large store there was a Hoover washer display, otherwise none but machines of German manufacture and

Detail of a cooker hob showing raised ring-type hotplates and method of identifying plates by means of positional dots on switch panel

design were to be seen. The Miele firm produces a domestic clothes spin dryer to replace the wringer and it has proved very popular. It is made in two sizes to take 5 lb and 10 lb of clothes respectively.

Carpets are not used to anything like the same degree as in this country and consequently there is not the same demand for vacuum cleaners. The Siemens "Rapid" cleaner combines some of the features of both the cylinder and upright types as known in this country. Refrigerators, I found, were very expensive and though there was undoubtedly a large potential demand for them prices limited the sales.

Some kettles of the British type were in use but a more popular appliance and a most efficient one was the "Rapid-kocher." This not only served as a kettle but could be adapted for heating milk and boiling eggs. Portable immersion heaters of various sizes and types are exceedingly popular and are used to heat water in jugs, buckets and baths. Whilst not prohibiting their use, neither company I visited encouraged the use of heaters in baths.

Storage water heaters were in extensive use during my visit, the "under the basin" type being more popular than

Rotary ironer in use at the Weser Ems Co.'s experimental kitchen

in this country. Shower baths complete with electric storage heaters were more popular in rural areas, as they occupy less space than a bathroom. There is a form of tax on domestic appliances, but this did not seem to be so heavy as purchase tax is here.

It was not possible to obtain precise figures of the rural electrical development throughout Germany, but I was told that in the supply area of the Weser Ems Company, more than 95 per cent of the rural premises were connected. This company had revived a scheme introduced twenty years ago. It was known as the "Example Farm Scheme." In the different districts the engineers were asked to supply the names of farmers with a progressive outlook and a high standard of farming. The position was investigated and the economic possibilities were assessed. The farmer paid the cost of the wiring of the appliances—on easy terms if desired—and the energy consumed. The appliances were then left on free loan for 6-12 months. Each piece of

apparatus was metered separately and the meters were read daily and the consumption entered in a book provided. The running costs were easily ascertained both by the company and the farmer. If extra cooking had been done the farmer's wife underlined in red the extra consumption. At no time was the farmer under any obligation to purchase the appliances and the electricity consumed was charged for at the normal rate.

There was just one condition attached to the scheme and it was that the farmer would allow interested parties to visit the farm during the trial period and see the appliances in operation. The district manager and the demonstrator visited the farm each month. It invariably happened at the end of the trial period, I learned, that the farmer and his wife had become so conscious of the benefits obtained from the appliances that they were only too anxious to retain them. As compensation for allowing the farm to be used for demonstration purposes, the farmer was allowed by the company to purchase the appliances installed at his farm at cost price. Then the experiment started again in another locality.

I met with a particularly unusual application of electricity at the famous duckling farm of Georg Bölt, north-west of Oldenburg. There were over 100,000 ducklings on this farm when I visited it. For the home market these were plucked, drawn and frozen in enormous quantities. An extensive export business was done and to comply with British fowl-pest regulations ducklings for this market had to be cooked before being frozen. Twenty-four domestic electric cookers without hobs or legs were stacked in three tiers of eight each and used for this purpose.

In Darmstadt I visited a "Teaching Kitchen." Here sixteen children or adults could be instructed in the practical use of electrical apparatus. Two people worked at a bench provided with a cooker which was metered, cupboards which held utensils and dishes, a drawer for cutlery and plastic equipment (each group having different colours), a stool and fitted chopping board. There were eight of these benches. Classes were held both in the afternoon and the evening, the evening being reserved for those who worked during the day. After preparing the dishes the students laid the tables, served the meal and then sat down and ate what they had made. A small charge was made to cover the cost of the ingredients.

Differences in Design of Appliances in the

LOW COUNTRIES AND DENMARK

By MARY S. MITCHELL

Miss Mitchell was the 1955 Caroline Haslett Trust travelling exhibitioner. She is Senior Demonstrator in the St. Pancras District (London Electricity Board)

IN the Low Countries and Denmark, customers choose their domestic electrical appliances from their own manufacturers and from many European countries, as well as some from the United Kingdom and the United States. From the last two sources, only equipment conforming to Continental usage is acceptable and this qualification rules out some items, notably cookers.

It seems natural to begin by discussing the differences between British and Continental styles in the kitchen, both because it is the centre of domestic interest and because the largest differences lie therein. In cookers, the principal practical differences are more hotplates, a smaller oven and the absence of a grill-boiler. These points reflect the style of cooking, more being done on the hob, rarely more than one dish at a time in the oven and a great deal less grilling and toasting.

A typical up-to-date Belgian cooker has four solid hotplates: a 6in (1 kW), a 7¼in (1·5 kW), an extra fast 7¼in plate (2 kW) and an 8¾in (2 kW). The switches for the ordinary plates have six positions, and that for the fast plate eight. An example of the six settings is 2,000 W, 1,400 W, 950 W, 450 W, 305 W, and 200 W, and, in some cases, very precise cooking instructions are given in recipes as to which setting to use. The plates plug in centrally and round each is a rim of polished metal to prevent spillage seeping through the hob. They are often raised about ¼in above hob level and the practice is one-plate-one-pan. Except in Denmark, radiant plates are not nearly so popular as in this country; the extra fast solid plate is regarded as being superior.

The most modern cookers have hinged lids which also form splashplates, but the majority have neither lid nor splashplate. Hobs are often extended beyond the width of the cooker, either as a one-piece casting or by detachable flaps. The large amount of hob cooking makes extra width very useful.

All ovens have drop-down doors and top and bottom heating, and in the typical cooker under discussion, the top heater consists of two tubular elements (700 W and 2 kW) which together also form the grill. The bottom (1 kW) element is beneath the oven lining. There are two oven switches, one giving various combinations of the elements, and a thermostat. Thus, for ordinary grilling, both top elements work together; the thermostat is set at 450 to 525 deg F, according to the type of food, which is placed as close as possible to the grill, while the door is kept open throughout. For roasting red meats, again only the top elements are used, but the thermostat is set at 500 deg F, the pan is placed near the bottom of the oven and the setting at once lowered to 400 deg F. For white meats and all other baking, the switch position combining the top (700 W) and bottom elements is used, and the thermostat is set to keep the necessary temperature.

Although ovens are small, it is possible to use them more fully than is customary, and an interesting campaign by one of Denmark's largest supply companies encourages housewives to do this. A demonstration showing their capabilities can be a revelation and, once they have been convinced, housewives take to the idea enthusiastically.

Cooker manufacturers also make "cooker separates," namely, self-contained ovens and units of one, two or three plates. These take more horizontal space, but eliminate stooping and have a degree of flexibility impossible with standard cookers, while serving the same purpose.

There are certain popular adjuncts to cookery, and foremost amongst motor-driven appliances are coffee mills,

especially in Belgium where coffee is taken very seriously, and is freshly ground for every making. Others rapidly gaining popularity are portable mixers, used principally for liquidising soups and making mayonnaise, especially in Belgium. The body of some of the most popular mixers is somewhat like a revolver with a long, thick barrel, mounting the cutting blades at the extremity, and is thus suitable for use in the large, deep soup pans, or for mayonnaise, etc., in smaller vessels. These mixers are comparatively inexpensive, but for the more well-to-do there is a bewildering choice of comprehensive food preparation machines, including British and American models. The Continental housewife appears to be "sold" on the idea of kitchen machines.

Amongst heated auxiliary cooking appliances, jug-shaped water-boilers, of about 5 pints capacity and up to 1·6 kW, are the most used. They are more common than ordinary electric kettles. A modified version boils milk without danger of spillage.

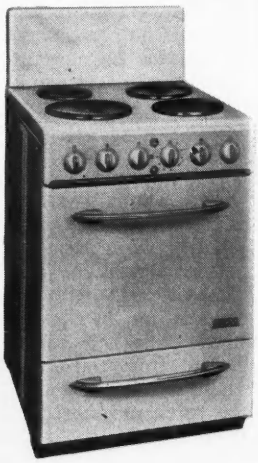
Gaufres, traditional waffles, are universally eaten in the Low Countries; consequently waffle cookers, with interchangeable grids with holes of varying sizes, are more used in the home there than here.

In Holland, where as much tea as coffee is drunk, "*theelichtjes*" are found. These are heated tea- or coffee-pot stands, with about 60 W loading, and are usually decorative, as they appear at table.

Water heaters range in size from 1·1 gallons to about 40 gallons for domestic use. In construction many are similar to our own, but there are internal differences where they are used exclusively on a night tariff. This is the case in Belgium for almost all water heaters except the 1·1 gallon 2 kW size, and very largely also in Holland. This makes electric water heating very competitive. The supply is controlled by a time switch, which also operates

The "Lavet" used in Holland—a combined laundry sink, washing machine and sitting bath

Right: Belgian cooker with four boiling rings, splashplate and unheated drawer; total loading 9·5 kW



Below: Oven of the cooker—much shallower than the exterior view suggests

a magnetic valve controlling the cold water inlet. In this way, when the heater is off, no cold water enters to chill the hot. All the hot water, except that contained in a "sleeve" surrounding the vertical element, may be drawn off. Upon switching on the water trickles in slowly, on to the element in the sleeve. By the time the trickle causes this to overflow it is already hot, and the tank is timed to be full and hot by 6 a.m. As the supply is available for at least eight hours, the loadings are quite low, e.g. 500 W for seven gallons or 1,800 W for 30 gallons. As this quantity of hot water must last all day, the capacities of the heaters tend to be larger than with continuous supply, for a similar range of uses. On the other hand, the use of shower baths and sitting baths, which are installed in many blocks of flats, lessens the quantity of water used for bathing. The very extensive use of a favourable night tariff for water heating, and in rural areas for cattle feed boilers, is one of the bases of the tariff structure.

Laundry appliances include washing machines, hydro-extractors, dryers and irons. The range of washing machines is truly international. As well as models from several European countries, there are British and American machines. It is gratifying to note that some Continental machines are equipped with a well-known British wringer. Apart from the "Lavet," described later, most of the machines are of conventional agitator, pulsator or fully automatic design.

Hydro-extractors are much more popular than in this country although efficient wringers are fitted to most machines. The chief reason given for their widespread use was that in small flats where there was absolutely no chance of outdoor drying, every drop of moisture removed shortened drying time.

A Danish firm manufactures an interesting type of wringer which is attached to the side of a small pulsator-driven machine. It consists of a circular metal container about 18in high, with a rubber lining bag, and a metal lid, up from the centre of which comes a rubber drain pipe. The wet articles are put into the bag, the lid is clamped on and then tap water under mains pressure is run into the space outside the bag, until the pressure of water built up

has compressed the bag and its contents to such an extent that the surplus water is driven out. The result is articles as dry as those put through a wringer, and at a not very great expenditure of mains water.

It can be said that to some extent in Denmark the demand for family washing machines is decreased by the widespread provision of communal laundries on municipal housing estates. Where these are available, it is usual for the authorities to adhere to the traditional once-a-month wash for the household articles. Since this causes a considerable accumulation of work, the laundries are equipped with machines capable of taking at least 40 lb of dry work. Hydro-extractors, drying arrangements and a small calender are also provided. These machines are of robust commercial type, but are, at the same time, simple for the housewives to use unsupervised. These laundries are provided either as single units in each block of flats, or as separate buildings housing several sets of machines and run by a staff. Here, the tenants either do the work themselves or, at a slightly increased charge, leave it to be done by the staff. In this type of laundry it is possible to run a daily "nappy" service, which is operated by the staff.

In Denmark, also, the simple wash-copper was far more in evidence than elsewhere, while in all three countries there was a wide and international choice of hand irons, and several types of ironing machines.

In Holland, a novel piece of apparatus known as a "Lavet" is installed by some municipalities on their housing estates. It can be used as a laundry sink, washing machine or sitting bath. With this arrangement a bathroom is dispensed with, and the "Lavet" is installed in a form of utility room where it is used (with or without its electrically operated and removable agitator) for laundry purposes; as a convenient spot for bathing young children; or, with waterproof curtains round it, as a sitting and spray bath for adults.

Shower baths are much more used in the Low Countries than here. The disadvantages of the "Lavet" are that it supplants a cosy bath, and that the washer part is slightly less efficient than an ordinary washing machine, though obviously better than only hand laundering; a hand wringer can be set up across the bowl. In their new blocks of flats the Rotterdam Council are installing many of these "Lavets."

Having discussed some appliances where designs and traditions differ widely from those here, it may be remarked that no material differences exist in the design of refrigerators, suction cleaners or floor polishers and but little in space heaters, although the emphasis appears to be on panel-type convectors. The traditional form of heating is enclosed or semi-enclosed stoves, so that electric heaters of whatever type are mainly for between-season or occasional use. It is very rare for a household to rely entirely on electric heating.

Whilst visiting exhibitions, showrooms, retail stores, etc., in order to build up a picture of the general trend in styles and design of domestic appliances, it was pleasing to find literature from the leading British firms printed in the language of its country of destination. This would appear to be absolutely essential to good business.

In conclusion, it can truly be said that on both sides of the Channel, and particularly where traditions diverge, the leading manufacturers are well aware of their own customers' demands, that they fulfil these demands, and are sometimes a little ahead of them.

Automatic Greenhouse of the Future

IN the all-electric greenhouse of the future, the temperature, humidity, heat, light, air and the supply of water and food to growing plants will be controlled and carried out automatically by electrical appliances. Even the harvesting and packing of the crop will be done by automatic machines.

This was forecast by Professor R. H. Stoughton, D.Sc., Professor of Horticulture at Reading University, when he delivered the second George Johnstone Lecture at Seale Hayne Agricultural College, Newton Abbot, on 12th October. The lecture is sponsored annually by the South Western Electricity Board in association with the College to commemorate the contribution to rural electrification in the West Country made by Mr. George H. Johnstone, O.B.E., D.L., the well-known horticulturist and farmer, who was a part-time member of the South Western Board. The lecture deals with modern developments in the use of electricity in agriculture and horticulture, and is given each year by a leading authority on some aspect of the subject.

Professor Stoughton said that the greenhouse of the future would be a sealed structure, perhaps of transparent plastic, into which was blown air automatically conditioned to the right temperature, humidity and CO_2 content. The plants would be grown in an artificial medium with automatic control of their water and nutrient supply and a strictly controlled temperature regime. Natural daylight would be augmented automatically by artificial light of controllable spectral composition. The grower would not only have to be a highly qualified technician, but an even more skilled horticulturist than he was now.

Last year the value of home-produced fruit, vegetables and flowers (excluding private garden and allotment produce) was estimated at £134 million and imports amounted to £106 million. It was only by new and cheaper techniques in which electricity played an essential part that the home grower could hope to meet the challenge.

Electricity was vital in speeding up the many processes—requiring considerable skill if performed manually—in the growth cycle of individual plants. In horticulture, the uses to which it might be put were far more varied than in agriculture and included the almost innumerable applications of power from electric motors, and as a source of heat and light and the means of control of plant life. In "mist propagation"—a new technique—cuttings were rooted by spraying with water mist at intervals determined by a device called an "electronic leaf" in which the conductivity of a surface exposed to the spray controlled the flow of water to the spray nozzle. By electric light the flowering seasons of many plants could be controlled, so that, for example, chrysanthemums could be produced throughout the year. In fruit growing, electric frost alarms warned the grower in the middle of the night when damage from spring frosts was imminent and new electric water spray equipment prevented frost damage.

These were a few of the many ways in which electricity was not merely desirable but essential in modern crop production. Applications still in the experimental stage included the use of electric current to destroy weeds in a standing crop. A single touch from an electrode would destroy a seedling weed or unwanted plant immediately. Pests inside tissues such as bulbs could be destroyed by brief exposure to high-frequency fields; this might be extended to the destruction of wood-destroying insects in timber.

The Queen Opens Calder Hall

COMMENCEMENT OF SUPPLY TO THE GRID

BRILLIANT though breezy weather graced the occasion of the inauguration of the Calder Hall nuclear power station by the Queen on 17th October. Upon Her Majesty's arrival Sir Edwin Plowden, chairman of the United Kingdom Atomic Energy Authority, presented to her a number of notabilities, including his colleagues on the Authority, representatives of foreign governments, Lord Citrine (chairman of the Central Electricity Authority) and other distinguished people among whom was Professor Niels Bohr, the eminent physicist.

Her Majesty then made a tour of the station during which its construction and operation were explained to her by Mr. R. V. Moore, B.Sc., G.C., assistant director for civil reactors. Returning at noon to the specially-erected dais the Queen was accompanied by Mr. R. A. Butler, Lord Privy Seal, who took the place of Lord Salisbury, Minister responsible for atomic energy, who was unable to attend. Mr. Butler, in opening the proceedings, said that it might well be that soon after 1965, when the present nuclear power programme was expected to be completed, all further power stations would be atomic and that possibly by 1975 the output of power from such stations would be double the capacity of all existing power stations in the country. The harnessing of nuclear power at a time when existing resources were being overtaxed was indeed an epoch-making event.

Sir Edwin Plowden welcomed Her Majesty to Calder Hall and spoke of the rapid advances that had been made in the harnessing of nuclear energy culminating in the industrial-sized power station which stood before them.

He expressed the gratitude of all in the Authority for the help that they had had from British industry. From now on industry would play an even larger part. The Atomic Energy Authority would remain a pioneering body and it was industry that would be responsible for developing and building atomic power stations for the electricity authorities at home and abroad.

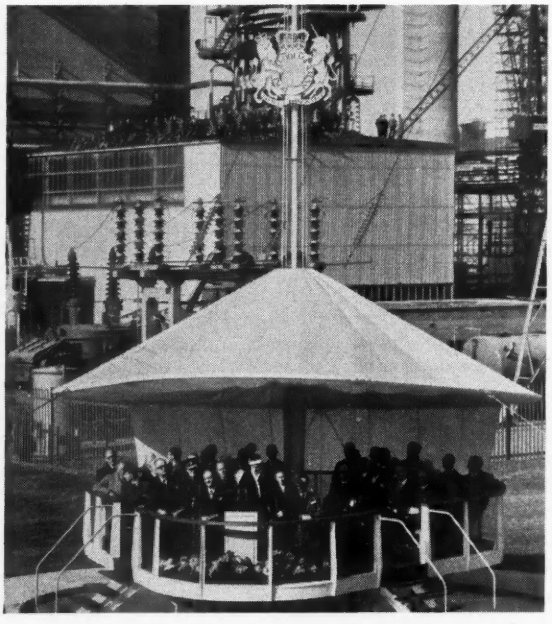
For the last eighteen months four groups of firms had been studying Calder Hall and preparing themselves to build power stations of the same type. They had already submitted tenders to the Central Electricity Authority for the first two stations the building of which would begin next year. They believed that the experience gained in building Calder Hall would prove of great benefit and that the new stations would produce electricity at a price comparable with the most modern type of coal-fired stations in this country.

To meet the growing demands of industry the Authority's Reactor School at Harwell had been expanded and in about a month's time they would be opening at Calder a Reactor Operations School which would eventually take from this country and abroad about 100 students a year. That day saw the birth of a new industry. If they followed up this first success with vigour and determination, the country and the world would be assured of a source of power which would be inexhaustible for many generations to come. Calder Hall was a supreme example of what could be done by the skills of scientists, engineers and workpeople acting together and it was a good augury for the future.

In the course of her speech the Queen said that the company that day was present at the making of history. So quickly had we learned to accept the pace of modern development that we had been in danger of losing our sense of wonder. That sense had been dramatically restored by the advent of the atomic age. She congratulated all who had shared in the fine project and it was with pride that she opened Calder Hall, Britain's first atomic power station.

Her Majesty then moved a lever which had the effect of connecting the station to the national grid and putting into operation a large kWh meter which had been erected on the central front of the station.

Her Majesty connects Calder Hall station to the grid. On her right are Mr. Aubrey Jones, Minister of Fuel and Power, and Mr. R. A. Butler, Lord Privy Seal. Behind the microphone on the Queen's left is Sir Edwin Plowden, chairman of the U.K.A.E.A.



Nuclear Development Publication

THE Central Office of Information reference pamphlet "The Commonwealth and Nuclear Development," 5,000 copies of which have been sold since it was published in August, 1955, has been revised and enlarged.

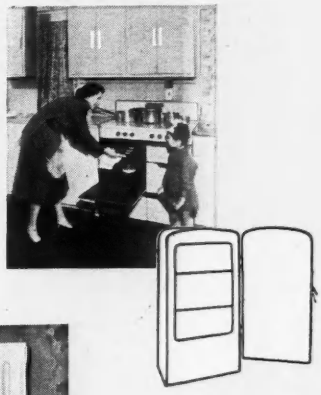
New material in the pamphlet (obtainable from H.M. Stationery Office, price 3s 6d) includes a description of the agricultural applications of radio-isotopes, e.g., in assessing the value of soil fertilisers. Isotopes solved a botanical mystery by revealing that honey can become contaminated by poisonous insecticides carried from the nectar of sprayed plants. They also have a use in preventing potatoes from sprouting too quickly.

The section on safety and health now includes a summary of the Medical Research Committee's report on the effects of nuclear radiation. The role of industry receives more attention, and the pamphlet mentions the prospects for British firms in exporting research reactors and nucleonic instruments as well as nuclear power stations. Over 250 British firms are engaged in the atomic energy industry.

Other additions are a complete list of all the nuclear reactors at present working, being built or planned in the United Kingdom; a glossary of technical terms for the non-scientific reader; and an enlarged bibliography. The pamphlet is produced primarily for overseas readers, and is being distributed abroad in English, French and Spanish.

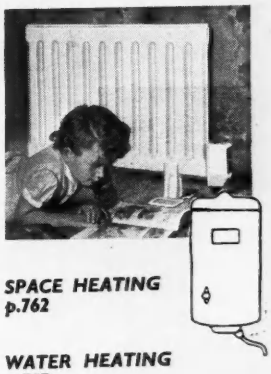
Domestic Electricity

A SURVEY OF MODERN APPLIANCES



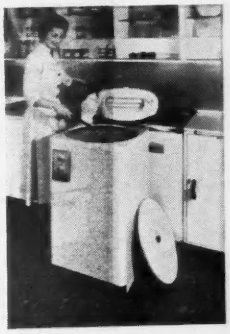
COOKING p.755

REFRIGERATION p.760



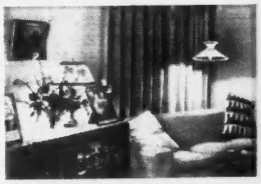
SPACE HEATING p.762

WATER HEATING p.767



LAUNDRY p.768

CLEANING p.772



LIGHTING p.774

MISCELLANEOUS p.776

DOMESTIC electrification is by no means the least important factor contributing to the success of the electrical industry and as every year the number of consumers rises the percentage increase in the actual domestic load is probably larger than that in the number of consumers. In thousands of partly electrified homes additional domestic electrical appliances will no doubt be installed as the usefulness and convenience of electricity makes itself known, and with the growth of rural supplies there is little likelihood of saturation point being reached for many years.

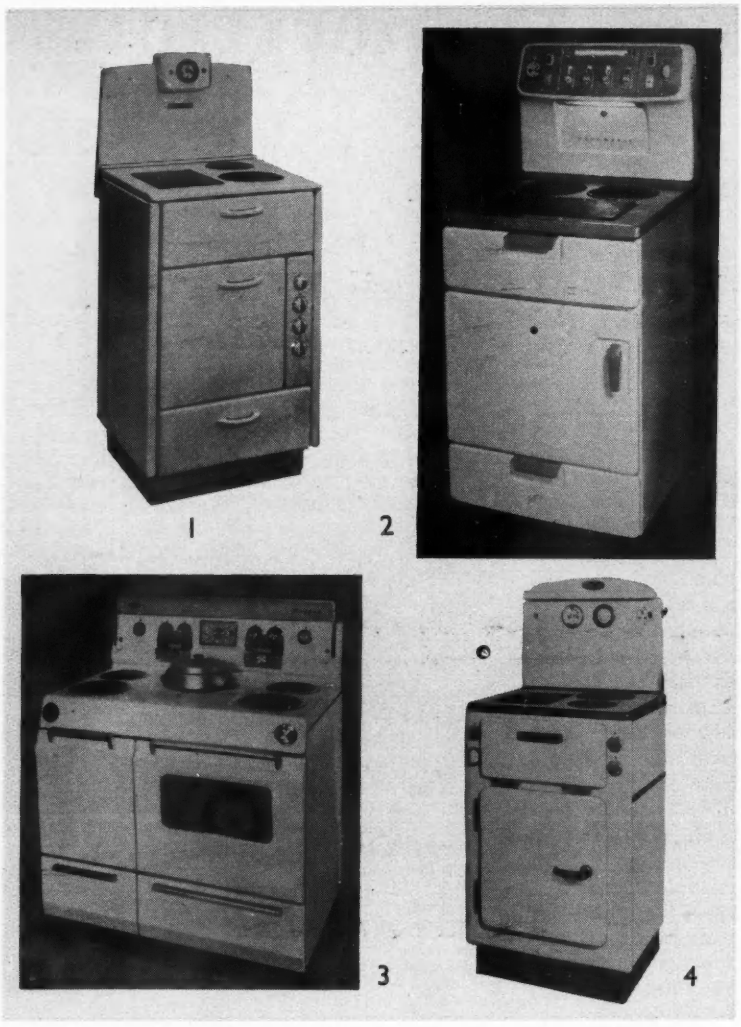
Providing as they do not only the means of saving both time and labour, but that extra degree of comfort in the home, the wide range of equipment now available has in no small way contributed to our present-day standard of living. Unfortunately, these appliances must still bear the inevitable burden of purchase tax which has again been increased since our review last year. An item which still remains free of tax, however, is the backbone of the all-electric home, the electric cooker.

In the following article we endeavour to give a picture of the multiplicity of services which electricity can perform in the home, at the same time indicating trends of developments and popular demands. There is also a list of the appliances available, with an indication of sources of supply, followed by the names and addresses of the respective manufacturers. As many of our regular readers will be aware, additional information regarding the more widely used domestic appliances is published at three-weekly intervals in the *Electrical Review* in the form of illustrated surveys, the data being given in tabular form. Next week we shall be dealing with low-temperature heaters, to be followed by thermal storage water heaters, immersion heaters, washing machines, wash boilers, etc.

COOKING

THE all-electric house can contain at least 40 different domestic electrical appliances, probably more if one includes workshop tools, lighting fittings, radio, television, etc. The majority of these appliances are to be found in the kitchen where obviously everything is centred on the cooker. There are in all about a dozen manufacturers of electric cookers who produce in the region of fifty different types ranging from the two-plate cooker to de-luxe models incorporating every conceivable "gadget." Apart from the efficiency, low running cost, cleanliness and hygienic qualities of electric cookers there are now few which are not either fully automatic in operation or suitable for conversion by means of an automatic control panel.

Belling & Co. now offer many of their cookers in such colour combinations as green/cream, green/white, blue/



1. "Falco Freedom" electric cooker. 2. Revo "Revomatic" cooker. 3. Moffat 40A90 double-oven model. 4. Belling "64-Plus" automatic cooker

white, blue/cream, etc., with interiors finished in a light blue-grey vitreous enamel which is not only attractive but easy to keep clean. The control knobs and handles fitted to the conventional white or cream models can also be had in a choice of colours to match existing kitchen decorative schemes. The largest model in the Belling range, the "64-Plus," is claimed to present the latest improvements in design and is typical of the "luxury" class of cooker. It is a three-plate model fitted with an auto-oven timer to switch on or off at any period up to 11½ hours, a built-in four-hour delay reminder timer and an independent ringing timer which can be set from 1 to 60 minutes. A concealed tubular lamp floodlights the entire hob top and there is a built-in 13 A socket-outlet for kettle, percolator, iron, etc. Another refinement is a glass inner door but as Bellings have been fitting glass doors to their larger cookers for more than twenty years this is only to be expected.

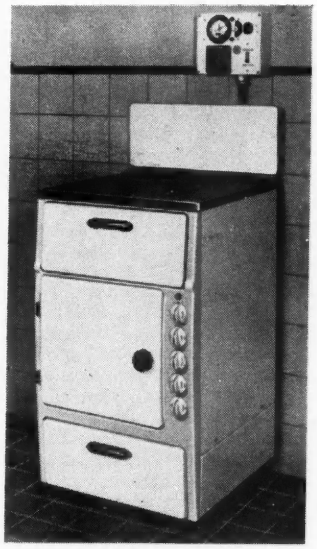
A glass panel may also be fitted to the English Electric standard cooker, model 2009D, and automatic cooker, model 2011. Other manufacturers, including the Jackson Electric Stove Co. and Simplex Electric, also favour the glass door, which has many advantages for although electric cooking requires the minimum of supervision some inspection may be necessary from time to time.

The introduction of an entirely new range of cookers, known as the "390," was announced by Jacksons earlier in the year. They are of pleasing appearance, a special feature being their bow front, the line of which is carried through to the hob. A large full-width oven is capable of accommodating a 30 lb bird and an average cooking temperature can be reached within 15 minutes. Leg, plinth and drawer models are available and all can be supplied fitted with the Jackson "Cookalone" auto-control panel.

Another new automatic cooker marketed only recently is the "Falco Freedom." Two boiling plates and a grill/boiler provide ample facilities for hotplate cooking and there are a large hotcupboard and grill compartment, and a utensil drawer. Falco have recently announced a reduction in the price of the "Falco Royal" luxury cooker which, in addition to the cream or white finish, is now also available in pastel shades of blue, green or pink.

An electric cooker at a popular price with facilities for easy conversion to automatic operation is offered by the General Electric Co. Considerably more compact than previous G.E.C. models, it makes for more space in the kitchen for although it has a standard height of 36in with a depth of 21in, the width measurement is only 18⅛in. This smaller width has been achieved without any sacrifice of oven space by the removal of the switch panel from the oven side. The 8in hotplate fitted to both the two- and three-plate models is controlled by the G.E.C. simmer switch and the cooker can be adapted for automatic cooking in about 20 minutes by means of the "Autotimer" designed to replace the splashguard. Both leg and plinth types are available and honeysuckle or gleaming white enamel have been chosen for the finish.

A new version of the Creda "Star" cooker, first introduced two years or so ago by the Simplex Electric Co., Ltd., is the "Stargazer." Many improvements are incorporated including a glass oven door for the plinth and drawer models and what is claimed to be a better oven than before due to new methods of heating insulation and door sealing. The company also continues to market its "Star" series of cookers, the popular "EV" type and

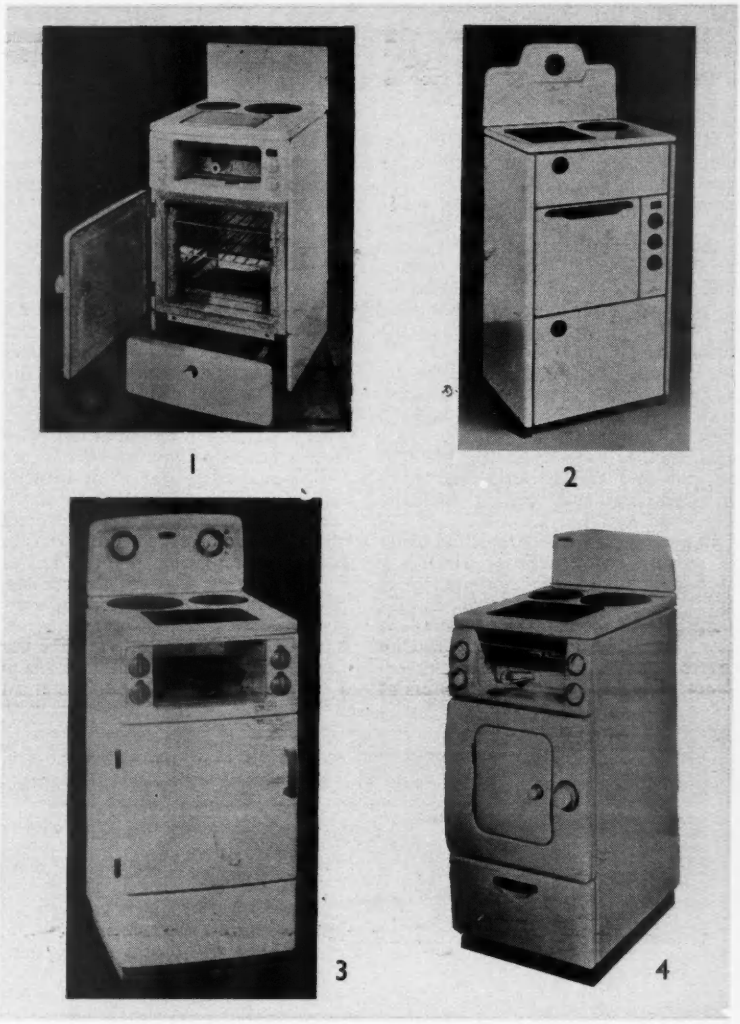


British National Electrics "Britannia"

the "Carefree," first announced last year. In addition there is also the luxury class "Comet" series ranging in price from £76 10s to £122 10s. The higher priced model, the "Super Comet," is provided with an automatic pre-set time control for the oven and plate warming drawer, and a canopy light illuminates the hob containing two 8in and two 6¼in radiant "Simmerstat" controlled boiling plates.

Whilst in the luxury cooker class, mention must be made of the 1956 range of Canadian imported "Moffat" cookers. Eight new models are now available in this country priced at between £92 and £170 10s. The most expensive cooker, or range as the Canadians prefer to call it, is a horizontal double-oven model which incorporates almost every conceivable cooking aid including a fryer and a griddle and, what is claimed to be completely new, thermostatically controlled top surface cooking. Four radiant type hotplates are fitted in addition to the deep-fat fryer. One of the ovens is 21in wide and the total load of the cooker is 18·35 kW at 240 V.

The bow front is also favoured by British National Electrics, Ltd., in the design of their new "Britannia" cooker. It has a large-size oven, a hotcupboard with drop-down door, and facilities for adding automatic time control and a warming drawer if required. Carron Company announce that their L.2 and L.3 cookers can now be had in attractive two-tone colour combinations and, if desired, with glass doors. A large size grill/boiler, 16 by 8in, is a special feature of the Revo "Revomatic" cooker which has in addition two 8in boiling plates. All controls are mounted on the timer control panel



1. Jackson 390 JD drawer model electric cooker. 2. Tricity "Coronet 550" cooker. 3. G.E.C. DC757 3-plate cooker. 4. Simplex Creda "Stargazer"

English Electric 2020 raised oven cooker

and special colours for the hob include "Guardsman" red, "Dresden" blue, "Willow" green and "Citron" yellow.

The English Electric raised oven cooker breaks with conventional cooker design and is still the only automatic cooker of its kind having the oven supported above the hob. The drop-down oven door forms a sturdy shelf for food preparation or serving and will support a weight of up to 56 lb.

For those who enjoy entertaining but find it difficult to be cook and hostess at the same time, the English Electric plate warmer may help to solve the problem. Made of a specially toughened glass with a low wattage element bonded to the inner surface, it is an attractive appliance and is suitable for use in either the dining room for formal occasions or the living room for buffet parties. The Revo "Mayfair" plate warmer, designed in contemporary style, adds distinction to the sideboard with its polished stainless steel top, black legs and moulded handles in amber shade. The 200 W element gives just the right temperature and a red light glows in the side when in use. A special insulated base prevents any heat from harming polished surfaces. The Kaymet table model hotplate is made from heat resisting toughened glass and the element covers nearly the whole of the underside of the top glass giving it a mirror-like appearance. Standard finish of the fitting is gold but a full colour range is available to order. The loading is 600 W and there are two sizes. In these days of rising fuel costs the 700 W Hawkins "Ovenette," capable of accommodating 6 or 7 lb of food, is rapidly finding favour. It can be used for roasting, baking or grilling and is even suitable for fruit bottling. Other manufacturers of portable cookers include C. Hounslow & Co. ("Chalex"), Dexray Engineering Co. and Warnford Construction,

Ltd. The last mentioned company produce the "Mastercook" which is particularly suited to the flat dweller or those who live in bed-sittingrooms as it can be supplied from the lighting circuit.

Most of the cookers previously mentioned are provided with solid type boiling plates as standard, but radiant plates are in most cases available as an alternative. The Metropolitan-Vickers Electrical Co. produce the well-known "Redring" radiant boiling plates which can be fitted to all post-war electric cookers designed to the E.D.A. interchangeability specification and also to the majority of pre-war models. What is claimed to be the biggest advance in electric cooking since the introduction of the radiant plate is their new boiler/griller. This adds another radiant boiling plate to the hob and at the same time gives better grilling and toasting facilities. The total loading is 2,250 W.

In view of the considerable use made of radiant type hotplates Hague & McKenzie stress the importance of their "Pyramid" black ground base utensils. All the company's saucepans now have heat resisting Bakelite covered handles and are steel reinforced. Ernest Stevens, Ltd., manufacturers of "Judge" electric ware, produce a wide range of stewpans, porridge saucepans, milk saucepans, etc., for hotplate use, in addition to electric kettles in 3½ and 4½ pint sizes, finished in turquoise and silvery green.

For really speedy cooking, saving not only time but electricity because it grills both sides at once, the Brattel "Hostess" infra-red grill has many advantages. It can be used at the table and—of particular interest for those on a diet—no fat need be used. The grill is compact; it measures 10 by 9in and weighs 14½ lb, the loading being 2 kW. Infra-red grills are also available from the Infra-Heat Co., Ltd., who market the "Gastronom" with twin grilling plates, a single grill "Perfect," and their latest model, the "Silver Grill." This is claimed to be the lowest priced electric grill of its type on the market.

The modern toaster is an attractive appliance and most makes are easy to keep clean, being either chromium plated or finished in a heat resisting enamel, an important point in relation to hygiene. Apart from the breakfast table, toast is often required for soups, savouries, etc., and with most models it can be available within a few minutes.

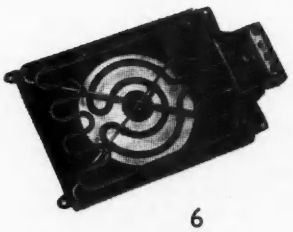
Non-scorching glass door panels are a feature of the Hotpoint toaster and a popular line of Bulpitt & Sons is their "950" turn-over two-slice model. In all there are about fifteen manufacturers of toasters, many of whom produce an automatic model. This type can be adjusted to any degree of brownness and require no supervision.

The single-slice double-sided "Tip-Toaster" manufactured by Easipower, Ltd., is claimed to retain all the wholesome qualities of the bread which, when ready, is ejected into the hand by pressing one of the pick-up handles. Finish is in chromium plate and black plastic.

Bulpitt & Sons, previously mentioned in connection with toasters, are probably one of the largest manufacturers of domestic electric kettles, listing nearly thirty models including a whistling kettle and a combined kettle and saucepan.

It is said that a watched kettle never boils, but leave it for a moment and the kitchen is full of steam. With the Russell Hobbs vapour-controlled kettle this need no longer be a worry as when it boils an indicator lever automatically snaps out, switching off the element.

Best Products' "Jiffy" 2-pint kettle has been specially designed for those who want a small quantity of boiling water quickly. This kettle is fitted with a 1,250 W automatic safety element and as a further safety measure the Bakelite handle has a special fixing which prevents all possibility of the handle rotting or working loose through the action of steam and heat. The company's 3-pint "Family" kettle is now fitted



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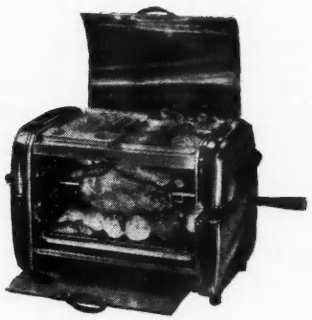

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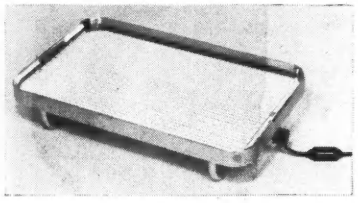

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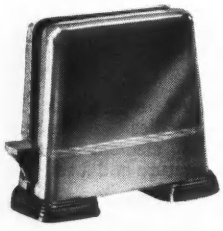
1. *Kaymet electric table hotplate*
2. *Easipower single-slice "Tip-Toaster"*
3. *Revo "Mayfair" plate warmer*
4. *"Don" handy toaster (New Forest Services)*
5. *Ernest Stevens "Judge" Ware special shape electric kettle*
6. *Metropolitan-Vickers "Redring" two-element boiler-griller*
7. *Brattel "Tudor" infra-red rotary spit*



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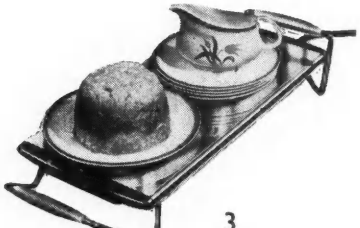

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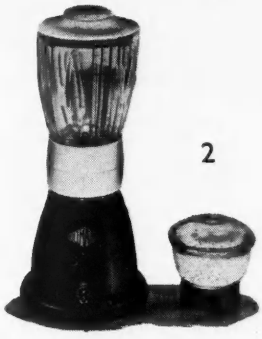

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tive items of domestic electrical equipment and can be used if desired on the dining room table or sideboard as well as the kitchen. Best Products "No. 2" model is now offered in five finishes, including polished chrome, and being automatic throughout will give coffee just to one's liking whenever required. When percolation is finished a green light replaces a red, indicating that the coffee is made and is being kept hot until needed. It has a maximum capacity of 2½ pints.

Apart from a few urn type models most percolators are of the conventional coffee pot shape and are finished in chromium on copper, although a few of the lower priced models are of aluminium. The ceramic pot, claimed to help retain the full coffee flavour, is favoured by Russell Hobbs and Elga Products, Ltd. With this type it is also possible to obtain matching sugar basins and cream jugs.

According to S.L.R. Electric, Ltd., full flavoured coffee can only be made in a brewer which does not allow the coffee to boil, consequently this method is adopted by them and the coffee is actually brewed in the top glass container. Incidentally, S.L.R. Electric are one of the few firms that produce a domestic waffle maker; another manufacturer is Dualit, Ltd.

The use of an electric food mixer eliminates much of the hard work entailed in the preparation of food in the kitchen, and, in addition, the scope of beverages and dishes can be extended. One 5-pint and one 2½-pint capacity heatproof bowls are supplied with the English Electric mixer. The head is removable and may be used independently of the stand for such jobs as creaming potatoes, etc. Mixing, beating, whipping or blending light and heavy ingredients are provided for by selecting one of twenty speeds set on the side of the mixer. Optional attachments include a mincer and a juice extractor. Kenwood Electric's A.700 "Chef" model has probably more accessories than any other domestic mixer of its type. Among these attachments are a juice extractor, meat mincer, coffee mill, potato peeler, can opener and other devices. The same company's "Rotoblend" consists of a powered unit on which is fitted a juice separator. A multi-purpose liquidiser attachment and a high-speed slicer and shredder may also be added. The Kenwood "Minor" portable mixer has a thumb operated switch so can be used with one hand only. When not in use it

with a choice of attractively coloured handles and lid-bars in shades of black, red, blue, green or dove grey. It can also be supplied in gay enamel copper finishes in red, primrose, blue or bronze. Best Products also produce a whistling kettle with a difference, the "Fanfare." As its name implies, instead of a whistle it gives a warning by a loud, pleasant organ tone chord.

The G.E.C. range includes 3- and 5-pint models, all fitted with 2 kW quick boiling elements, while Metway's "Minniway New" non-automatic kettle with a 2-pint capacity has a loading of only 750 W.

L. G. Hawkins have produced a 3½-pint vitreous enamelled kettle since our review last year. This model, LGH.404, is finished in a pastel green shade and has a large spout for quick pouring. A tea kettle with a removable heating element, the "Combinax," is manufactured by Eltron, Ltd., and for motorists, Filtrite, Ltd., offer their electric tea or coffee maker.

One of the benefits of the automatic tea and coffee making sets is the luxury of tea in bed in the mornings without the necessity of getting up to prepare it. The more elaborate types, such as those manufactured by L. G. Hawkins and the British Vacuum Cleaner & Engineering Co., need only the alarm to be set overnight for the time chosen to wake and in return will boil the water, make the tea, switch on the bedside light and ring an alarm when tea is ready.

Apart from their utility value, electric coffee percolators are attrac-

1. *English Electric food mixer with bowl*
2. *Hillman "Hillma-Mix" portable mixer*
3. *Chalfont "Streamline" electric kettle*
4. *Bulpitt "Mayfair" coffee percolator*
5. *Bulpitt 3-pint whistling kettle*
6. *Elga Products "Autoperc" coffee maker*
7. *Best Products "Jiffy" electric kettle*

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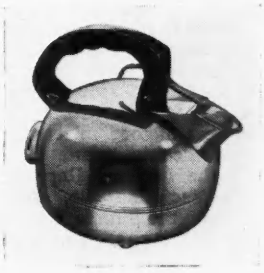

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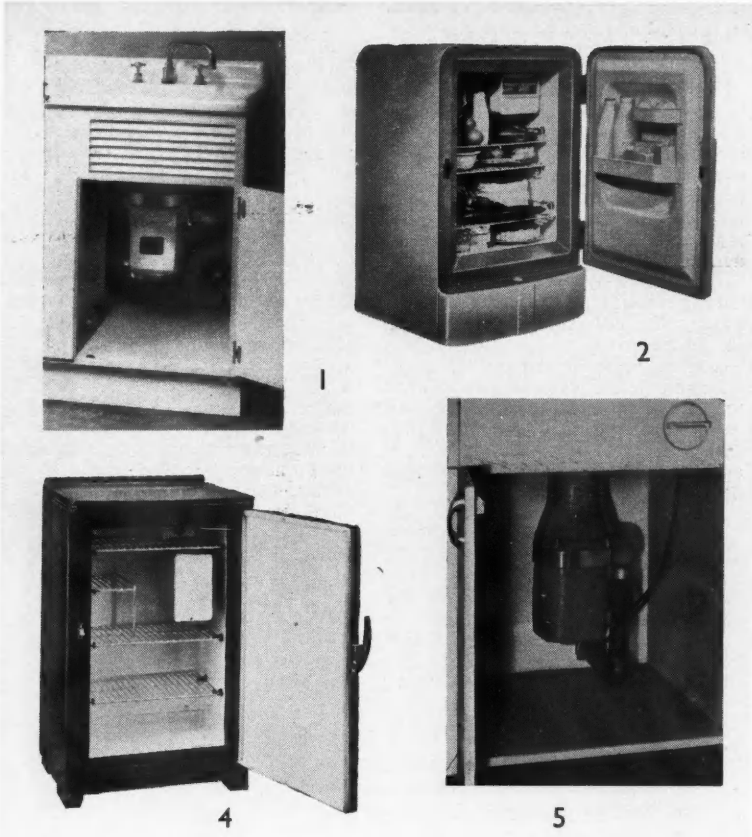

1. *Haigh "Tweeny" food waste disposal unit*
2. *Morphy-Richards "Astral" 2·3 cu ft console model*
3. *Main "32" 3·2 cu ft refrigerator*
4. *Coldette refrigerator in oak cabinet*
5. *"Wastemaster" food waste disposal unit (Dishmaster (London), Ltd.)*

can be hung on a special bracket fitted to the wall with the beaters on either side. The total weight is approximately 3½ lb.

Portability is a feature of the new "Hillma-Mix" food mixer (Hillman Electric Motors) which incorporates a food liquidiser with a two-speed control. It has a capacity of 1 pint and is available finished in red, blue, green, primrose or white enamel. Other manufacturers of food mixers include Sunbeam Electric, Ltd. ("Mixmaster"), the Midland Repetition & Auto Manufacturing Co. ("Rapide Mixstir") and the Siroma Engineering Co. In addition, Brown Brothers market the "Duco" food mixer.

Apart from the preparation of food for the table it is essential to keep it warm and this is where plate warmers and heated food trolleys serve a useful purpose. The Premier Electric Heaters plate warmer is in two sizes, 20 by 10in and 30 by 10in, and both models are chromium plated. Respective loadings are 240 and 360 W. The G.E.C. also market an appliance of this nature with a heat resisting non-scratch glass top. The rolled sides of the warming plate are finished in chromium and the end brackets and feet are of heat resisting Bakelite.

Six people can be catered for by the Hawkins "Hostess" heated food trolley. Finished in bronze with chromium fittings or ivory with gold legs it provides an attractive piece of furniture for the dining room in addition to its utilitarian value. An additional switch socket enables other appliances such as a toaster or kettle to be used. The sideboard model performs the same functions as the trolley type and both models are supplied with four 2-pint sized Pyrex dishes, available with either glass or chromium lids.

The Bertram Thomas electric buffet ensures food being kept hot for long periods without loss of quality, and the company's various models have hot plates both on top of the trolley and inside an enclosed compartment. Extra sockets on the buffet provide for the plugging in of additional appliances.

Perhaps the most depressing task in the kitchen is washing-up but even this can be eliminated with the "Dishmaster." The manufacturers, Dishmaster (London), Ltd., claim that it will wash, rinse, sterilise and dry a full load of dishes and saucepans within three minutes. It is permanently connected to the hot water system and uses about two gallons of hot water for a complete washing and rinsing cycle. More recently a heated version of the "Dishmaster" has appeared on the market with the additional feature of a 3 gal hot water booster tank heated by 2 kW thermostatically controlled elements. The company also produce the "Wastemaster" unit which hygienically and automatically disposes of kitchen waste through the sink outlet.

Another food waste disposal unit is now manufactured by the Haigh Engineering Co., Ltd. This model, the Haigh "Tweeny," is so designed that if it becomes overloaded it automatically cuts out. It will grind up all types of food scraps, tea leaves, vegetable refuse, etc., and disposes of them down the sink. Little kitchen space is taken up by the appliance as it fits neatly below the sink.

REFRIGERATION

IT is estimated that while in America between 85 and 90 per cent of homes wired for electricity are equipped with refrigerators, in this country the proportion with electrically operated refrigerators is less than 10 per cent. It is debatable, however, whether this is really a fair comparison as here the domestic refrigerator is officially classed as a luxury bearing 60 per cent purchase tax and is also subject to hire purchase restrictions. To most people refrigerators mean safe food storage and that indeed is their primary use. There is also the luxury of eating foods out of season and many more refrigerators are now equipped with frozen food

lockers. Ample storage for frozen foods is provided in the full-width freezer of the English Electric, EA.83 8·3 cu ft model. This also contains a cold drawer for lower temperature storage, two refrigerated "humi-drawers" for food and vegetables, and a built-in three-shelf door store. Other models in the company's range include the EA.7501, also an 8·3 cu ft model, and the smaller table top type, EA.34, with 3·4 cu ft of storage space. The finish of all models is in cream or white.

Frigidaire offer a complete range of gleaming bright coloured models suitable to blend with any kitchen colour scheme. Their two large de-luxe models, O.D.T.79 and O.D.T.98, are provided with spacious multi-shelf food compartments, freezer chest, door shelves for egg and bottle storage, butter compartments, etc. Levelling gliders for use on uneven floors and an automatic interior light are also fitted. In addition, there are the Frigidaire "Master" models, O.M.T.81 and O.M.T.100, and a range of table top family designs. The smaller 4·3 cu ft family models are available in "Cotswold" cream and snowy white only.

The "Prestcold D.361" refrigerator has a total storage capacity of 3·6 cu ft and for the first time in a family size refrigerator the frozen food locker, with a total capacity of 9 lb, is wide enough to take a big dish with room to spare. This locker is fitted with a drop-down door and contains a quick release 18-cube ice-tray. Other design features are an automatic interior light, porcelain enamel acid-resisting interior and 3 sq ft table top. There is a choice of six colours for the table top and base, and these colours, with the white or cream cabinet, combine in any one of forty-eight different colour schemes.

A recent development of the G.E.C. is a 4 cu ft refrigerator with de-luxe furnishings. A compact table top model with clean lines, it has a splash-back which houses the thermostat and carries in the centre an automatic temperature control knob with eight temperature settings. Two racks for the storage of eggs and bottles are provided in the full length bowed door. Shelf area is 7·7 sq ft and a "turnaround" top shelf allows for the storage of tall bottles in one position. It can be turned round to give extra shelf space when bottles are not being stored. An interior light is fitted and the all-steel, all-welded cabinet is finished in gleaming white or honeysuckle coloured enamel.

The most interesting information to come from Electrolux this year is the announcement that they are producing their L.230 family model refrigerator in a cream finish. It has up to the moment been available only in white. The new addition has a cream body, turquoise door frame and door shelves and the name plate and trade mark on the ice compartment cover are also picked out in the same shade. The larger models, the L.500 with a shelf area of 9¾ sq ft, and the L.730, shelf area 14 sq ft, are also obtainable in cream.

A new built-in type of refrigerator, M.170, has been introduced by Electrolux as a successor to their M.151 model. The capacity is approximately 1¾ cu ft and shelf area 3·7 sq ft. Door shelves are included. The refrigerator is designed to be built into kitchen fittings at waist height or floor level and may be installed with its main face flush with the surroundings or with its side flanges overlapping the sides of the recess. It is finished in white or cream and operates on the absorption principle. Another absorption type model is the "Main 32" refrigerator. This has a larger than usual frozen food compartment and is claimed to be the first British refrigerator to carry a ten year guarantee of its sealed cooling unit. The capacity is 3·2 cu ft and special features include a reversible milk shelf, an interchangeable meat dish and salad crisper, and an easily accessible thermostatic control. The interior of its plinth base is not refrigerated but forms a useful storage compartment.

A new and larger console model

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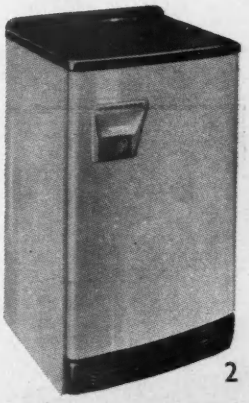

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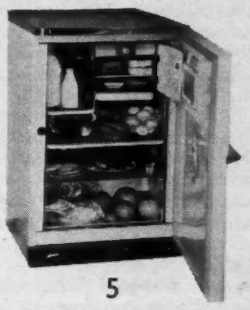

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1. *Kelvinator C.265K refrigerator*
2. *"Prestcold" D.361 3·6 cu ft model*
3. *G.E.C. DE.41 table top model*
4. *Electrolux L.230 refrigerator*
5. *Coldrator CT.45 refrigerator*

"Astral" refrigerator is being produced by Morphy-Richards, Ltd., in addition to the already popular 1½ cu ft table model. This new model has a capacity of 2·3 cu ft and will fit easily into any kitchen. Door shelves are provided and the finish is in white or cream.

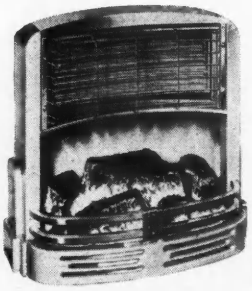
The Lec Refrigeration's 8 cu ft "Continental" refrigerator is another new de-luxe model. It is fitted with a cooled larder for the storage of eggs and small packages, a built-in butter compartment, full width freezer, three door shelves and storage chest for salads, etc. Finish is in standard white, but other colours are available on request.

A food storage capacity of over 3 cu ft combined with three shelves with an area of 6 sq ft provide ample room to satisfy the needs of the average family in the Wilkins & Mitchell "Servis" refrigerator. One of the few refrigerators produced in an oak cabinet is the "Coldette." An absorption type unit is used and the manufacturers, Coldette Refrigeration, state that in addition to serving as a refrigerated cocktail cabinet it also adds to the beauty of the home as an item of furniture.

SPACE HEATING

AS will have been seen from our recent survey (5th October issue) there are now almost 400 types of electric fires from which to make a choice, ranging from single-element bowl fires to the larger 2 or 3 kW models with imitation coal or log effects. From the point of view of cost they compare very favourably indeed with other forms of heating and in addition are not only clean and safe to use, but also free from dirt and fumes.

It has been said that nothing quite compares with the comfort of an open fire, but the question is asked—is it worth soot and dust, ash removal, etc.? The answer is given by the success which Berry's Electric, Ltd., have enjoyed for many years with the sales of their "Magicoal" fires. Three new models have been announced by this company in recent months, the "Minorberry," the "Masterberry 555" and the "Masterglow." The "Minorberry," a 2 kW coal effect model, is one of the lowest priced of its type in the Berry's range. The finish is in beige or oyster green with polished front bars, and full heat control is provided by two switches. The "Masterberry 555" is a 3 kW coal effect model and is finished in warm silver with polished rustless front bars. It can also be supplied with log effect. The 2 kW "Masterglow" is fitted with four rod type vertical elements, each set in its own reflector, and a special feature is the glow effect thrown out from its lower louvres. This effect is independent of the heating elements which are controlled by two recessed switches.



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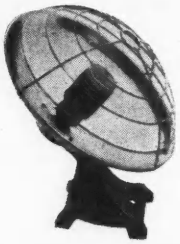

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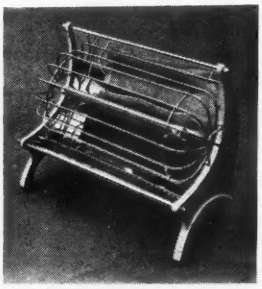

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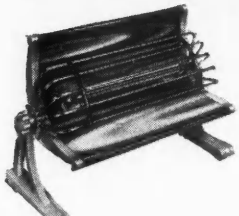

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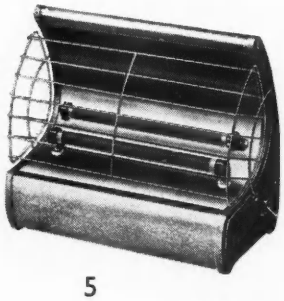

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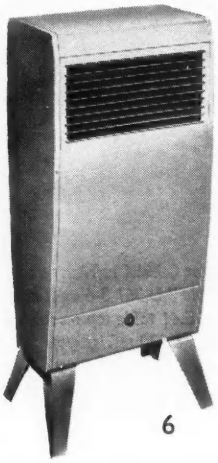

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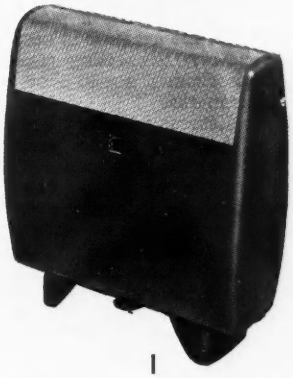
1. *Berry's "Masterberry 555" coal-effect fire*
2. *A. D. Davidson "Davey" 600 W bowl fire*
3. *Falkirk Iron Co.'s "Firefly"*
4. *Formo Products "Sunny Heat"*
5. *Jackson model 732J*
6. *One of the new L. G. Hawkins range of convectors*

Not new, but constantly growing in popularity is the Berry's thermostatically controlled "Raydair" electric radiator. In contrast are the company's period reproduction fires which have long been a speciality of Berry's. These include the "Wilton" 3 kW concealed heating fuel effect model, priced at a little over £100.

Belling & Co.'s wide range of fires and convector heaters includes firebar and reflector types, coal and log effect models, convectors and warm air circulators. If one had to pick out any particular heater for mention it would probably be the "Zephyr" convector. This heater is available in 1, 2 and 3 kW sizes and is attractively finished in bronze with a contrasting old gold front panel. All sizes are fitted with heat reducing switches and can also be supplied with thermostats as an extra.

The Jackson Electric Stove Co., Ltd., have announced their return to the electric fire market within the past year with the introduction of five attractive models, including two low priced portable fires, an all-chrome portable fire, an inset fire and a panel fire. The portable models (731J and 732J) are in 1 and 2 kW sizes and the 253J model, also portable, has a loading of 2 kW. The last-named has a one-piece front and reflector finished in chromium, neatly set off by the black feet and handle.

The inset fire (251J) is an all chromium model and has been designed to blend with any decoration or colour scheme. The two 1 kW elements are controlled by a switch mounted on the front of the panel and a plated wire guard gives adequate protection. The panel type (252J) has a loading of 2 kW and the chromium reflector is set in a mushroom coloured stove enamelled panel. A special "air-flow" convection system provides a warm current of air from an opening above the fire.



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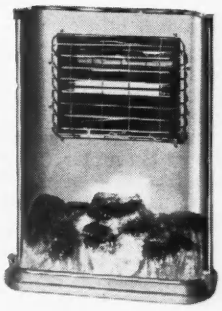

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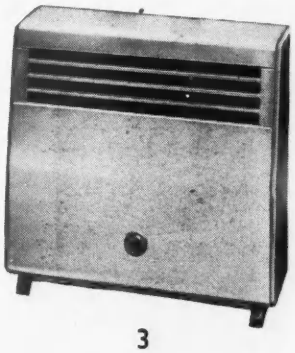
1. Ferranti model CF.6180 convector heater *2. Ferranti "Flamera" electric fire*
3. Thermovent SRC2 convector **4. and 5.** *Revo portable room heaters: F.14980 small model—no fire bar; F.14986 large model with fire bar*

A new 1 kW portable fire, the "Firefly," available in an attractive range of finishes including hammered gold, pink and green, and cream, is announced by the Falkirk Iron Co., and another 1 kW model, the "Cradleway," mounted on a chromium plated tubular steel base is available from Metway Electrical Industries. Simplicity of design is the keynote of the new L. G. Hawkins convector heater, one of its chief attractions being its finish in a range of six colours. These include such shades as ivory, pastel rose, mushroom, eau-de-nil and white, each with contrasting gold grille and feet, and all-gold. It is in 1 and 2 kW sizes and both switched and thermostatically controlled models are available. When not in use a pleasant warm glow shows through the grille, while a pilot light glows in the bottom panel. The company have also announced two new reflector fires, the LGH 339 and 340 "Boomerang" and LGH 337 and 338 "Loughton," both of which are proving very popular.

Formo Products, Ltd., a Graham-Farish company, announce details of their new "Sunnyheat" 1 kW fire. Suitable for either floor or wall mounting, it has a solid cast frame, ivory stove enamelled, and can be adjusted and locked at any angle. A 1 or 2 kW reflector fire, a 600 W bowl fire and a 2 kW coal effect fire are available from Endo Industries, Ltd., and Reeves Electrical & Radio Co. announce that a special feature of their range is the improved bowed guard now fitted to all models instead of the straight guards.

Such names as "Friar Tuck," "Maid Marion" and "Sherwood" have been adopted by Robin Hood Electrical Co. for their range of both 1 and 2 kW reflector models. A well-constructed portable heater suitable for continuous or occasional use is the Crossland "Raydant." This is a reflector type in 1 and 2 kW models and the company also produce their "Raybar" fitted with 1 or 2 kW fire bar type elements. Red, pale green and silver finishes are provided for all models, including the company's convector heater.



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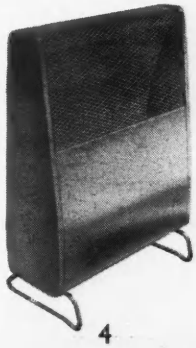

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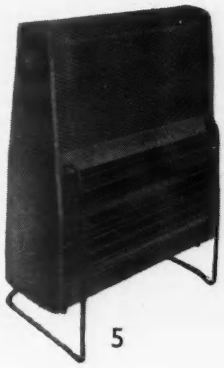

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Two new fires have been added to the range of reflector models produced by Gatehill Manufacturing Co. One of these, the "Windsor" is a 1 kW reflector model and the other, the "Elgin" bowl fire, is available with either 600 or 750 W spiral element. Both are competitively priced.

For the contemporary home the new Revo convectors solve the problem of economical heating. There are four models, available either as pure convector heaters or convectors with built-in radiant type electric fires, offered in a choice of three loadings. The radiant fire bar can be switched independently of the convector section and three of the models are supplied with thermostatic control if required. They are finished in three alternative shades that tone with any colour scheme.

The current range of A. D. Davidson "Davey" fires includes fire bar and reflector types and a new model to be seen this autumn is the "Davey" bowl fire. Solidly constructed with a cast base sprayed in a choice of three colours, it has a chromium bowl which can be adjusted at any required angle. The 600 W spiral element is protected by a chromium guard. Pifco, Ltd., still only list one fire, the 1 kW "Sheridan," first announced last year. Constructed of rigid steel with solid built ends, it has a hammered silver grey or gold enamel finish and is provided with a black plastic carrying handle. Competitively priced imitation coal effect fires are obtainable from T. Price & Sons ("Prilect") and the Grafton Heater Co., the latter company producing a 750 W model.

Modern styling is apparent in the latest additions to the range of heating appliances announced by G.E.C. which includes three new fires and two convector heaters. The first of these is a 2 kW 2-bar pedestal mounted "Cosyglo" model of unusual shape. It has a newly designed reflector constructed to provide all-round warmth over a wide area. Another model, also 2 kW size, is styled on modern lines and is finished in moonstone grey and burgundy with black legs. A honeycomb guard protects the elements. The convector heaters in 1 and 2 kW sizes are both similar in appearance having rectangular hammered bronze cases with dark bronze top and feet.

In the new season's range of Ferranti electric fires and convectors are three fires including a coal effect model, and an attractively styled convector heater, while Premier Electric Heaters announce their new "Hystan" 2 kW fire which has a one-piece steel body mounted on a solid rod frame. The finish is in cream with maroon moulded feet.

In the nursery safety is the first consideration where ordinary portable fires are not suitable when young children may be left alone. A typical example of a safety type heater which could be used for this purpose is the

new " Mayhurst " air-flow space heater produced by P. W. Baker & Sons. This thermostatically controlled unit has varying heat outputs and it also incorporates a fan which can be used independently to give a cooling effect during the summer months. A safety cut-out prevents overheating. For use in the bathroom, where it is essential that a fire should be installed in such a position that it cannot be touched by a person whilst in the bath, a wall mounting fire is desirable. Several are now listed by various manufacturers including the Heatrae " Saferod " which has been specifically designed for that purpose. This type of course is also ideal for the nursery.

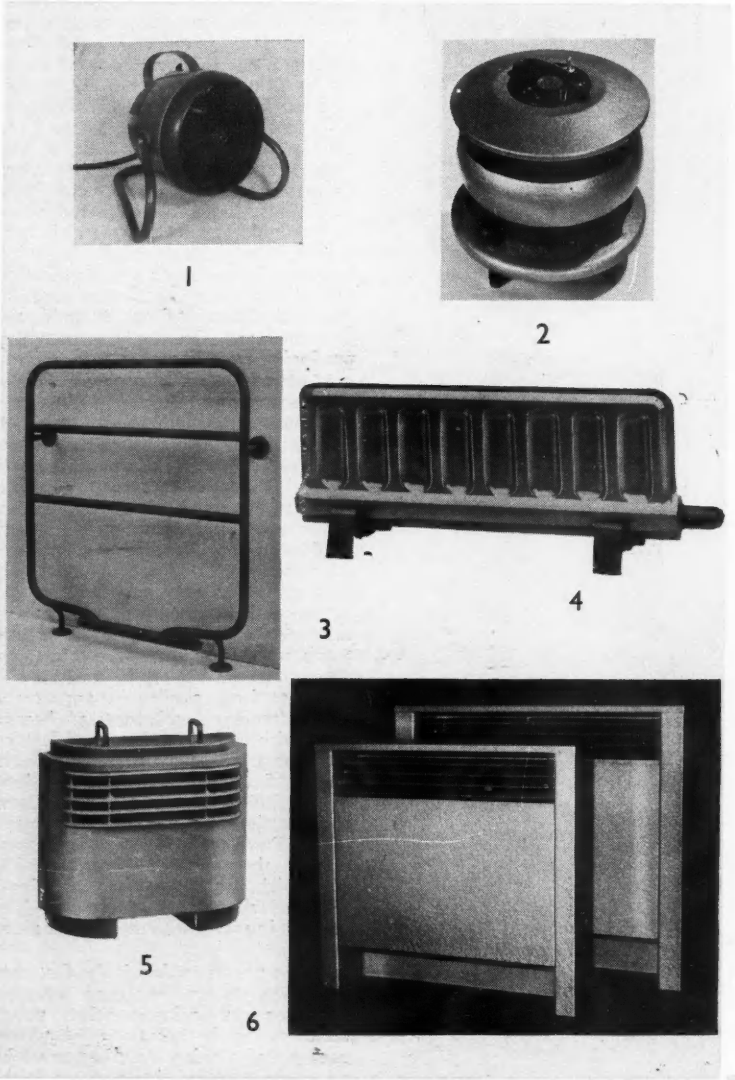
An extremely low centre of gravity makes it difficult for the " Argosy " convector heater (Argosy Engineering) to be knocked over and care has been taken to design it in such a way that the heating element is completely enclosed. To the well-known range of " Kaloric " convectors and unit heaters produced by M. & J. Lossos & Co. has been added the " Populair " panel type convector. This is at present being made in a 1 kW size and is finished in bronze cellulose and cream or light grey stoved enamel. A control unit for the " Kaloric " 3 kW wall mounted fan heater, by means of which the heating elements can be isolated and the fan kept in independent operation, is also announced.

Skilful design taking full advantage of modern plastic moulding technique has resulted in an exceptionally attractive appearance for the range of " Thermovent " heaters. Floor standing and inset types are available. The company also produce a range of " Thermopanel " radiant glass heating panels which heat by direct radiation within minutes of switching on. The element is fused directly on to the armour-plate glass which is tempered for strength, shock resistance and durability. Features include a pilot lamp which provides a pleasing soft glow when the heater is in use, as well as a new non-reflecting glass panel which is claimed not to show smears or finger marks.

The Siemens " Wafer " heater convector has for many years been supplied to the shipbuilding industry and because of its popularity and robustness the company now manufacture it for the domestic market. Principally designed for wall-mounting where space and projection is limited, it has an infinite life and, it is claimed, needs no attention. All heaters are fitted with a coloured indicator light and the finish can be either in hammered bronze, ivory, or mushroom. The top grille is finished in a heat resisting gold paint. They can be fitted with either an on/off switch, or, in the case of the 1·5 and 2 kW models, a 3-heat switch with off position.

Tyrad high temperature radiant panel heaters may be used with advantage for a wide variety of applications including domestic use. The panels can be fixed to wall brackets or suspended on chains, but if fixed at low level they should be screened by an open-mesh guard. The company's electric floor warming system provides an economic and automatic space heating installation for buildings and is normally arranged for use during off-peak periods.

Besides supplying panels for walls, ceilings and dados, etc., Panelec (Gt. Britain), Ltd., carry out complete floor heating installations employing heating cable in aluminium channels sunk into a concrete floor with expanded metal to disperse the heat. Wall-mounting low temperature panel heaters loaded at approximately 75 to 80 W sq ft are among lines of Unity Heating, Ltd., who also manufacture a range of " Floodwarmth " convector heaters. " Medrae " radiant panels are widely used for all kinds of space heating purposes and provide a high



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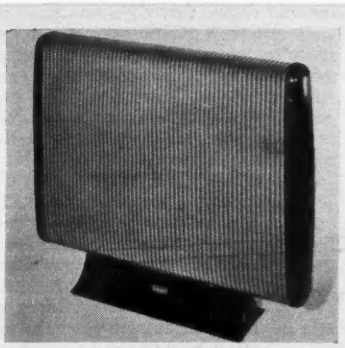
1. *Ashcroft Tools " WinSum " fan heater*
2. *P. W. Baker & Sons " Mayhurst " air-flow space heater*
3. *Dimplex oil-filled towel rail*
4. *Dimplex airing cupboard heater*
5. *Drydenvec " Junior " radiator and convector (Thos. Dryden)*
6. *Unity Heating 2 and 3 kW " Conp " convector heaters*
7. *Gatehill " Windsor " 1 kW fire*



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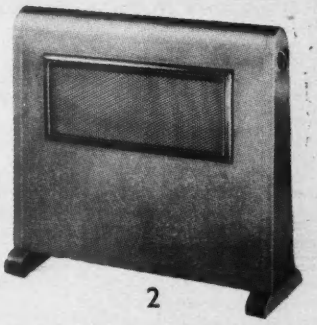

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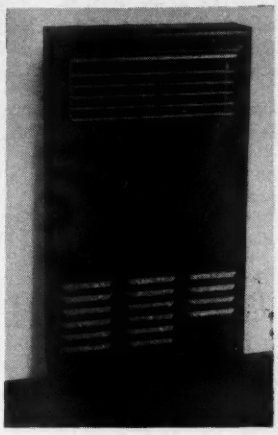

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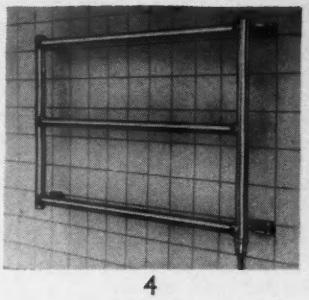

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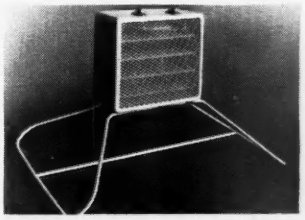

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1. *Simplex Creda "Capri" background heater*
2. *Crossland convector heater*
3. *Siemens "Wafer" convector heater*
4. *Hurseal wall mounting oil-filled towel rail*
5. *Gillott "Cotswold" fan heater*
6. *"Maybow" oil-filled bathroom heater and towel rail (MacKey Bowley)*
7. *Key-Leather Co.'s K-L fan heater and ventilator*

degree of comfort at moderate installation and running costs. Electrical floor warming is also carried out by this company—Dulrae, Ltd.

A light-grey stove enamelled finish has been added to the colour range available for Dimplex oil-filled electric radiators as the makers feel that this colour is extremely popular at the moment and also that it fits in well with modern interior decorations. Detachable single- and double-sided chromium towel rail attachments can now be supplied for all Dimplex radiators and the actual oil-filled electric towel rails themselves are available for floor and wall-mounting. The Dimplex airing cupboard heater is now being produced in two models, 150 and 300 W, fitted with excess temperature cut-out, and the company's skirting board heater is available in 2ft and 3ft sizes. The loading of these heaters is 150 W per foot run and they can be wired at either end and built up in multiples to a total loading of 2,500 W. All the foregoing Dimplex appliances are finished in a range of eight stove enamelled colours.

The "Maybow" oil-filled electric bathroom heater and towel rail produced by MacKey Bowley has a built-in towel rail which folds back when not in use and it is supplied with clamps for wall fitting. Total loading is 350 W and the standard finish is stove enamelled white. Other colours may be had to order.

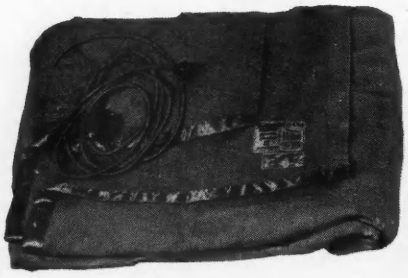
Designed to meet the needs of the housewife who has no means of drying or airing clothes after the family washday, the Thos. Dryden "Drydenvec" clothes dryer with its triple towel rail can also be used as a room heater. The loading is 500 W. Other forms of convector heaters are produced by this firm including the "Dwarf" air heater which has numerous applications.

Introduced for the first time in June, the new Hurseal J.10 radiator joins an already wide family range of hermetically sealed, oil-filled safety radiators. The J.10 is a two-column radiator with a loading of 1 kW and its low height of 17in makes it suitable for installation under windows. It can, however, be fitted with castors enabling it to be easily transported from room to room. It is marketed in the Hurseal standard colour range of cream and bronze and can also be obtained in blue, eau-de-nil, white and gold.

Oil-filled radiators are also produced by G.B.M. (Electrical) who provide ornamental wrought-iron frames for use with their column type radiators. These frames are designed to harmonise with any surroundings and are fitted with a heavy gauge semi-opaque glass top. Stoved enamel finish is in ivory or gold. The "Herga" electric wardrobe airer is in the form of a small heated panel and the manufacturers, H. G. Poxon Engineering, also design a wall panel heating system.

Simplex Electric announced recently that they will shortly be entering the domestic electric fire market with a new "Creda" 2 kW portable fire. Already announced are two new "Creda" space heaters, the "California" medium temperature heating panel and the "Capri" low temperature heater (see *Electrical Review*, 21st September, page 538).

The "WinSum" air circulator and fan heater (Ashcroft Tools, Ltd.) has been carefully designed to combine maximum heat and circulation, with a consumption of 1,125 W. Its tubular frame construction allows it to be placed on the table or hung on the wall for use as a hair dryer, or without the heater, as a fan. It is finished in a range of two-tone pastel colours and for the modern kitchen a special model is available in red and ivory.



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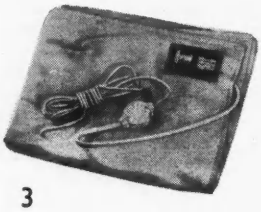

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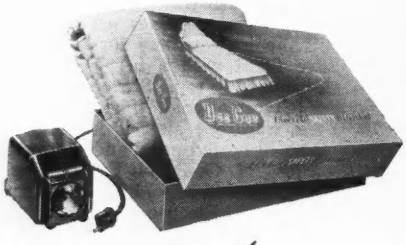
1. *Isopad "Lana" blanket*
2. *Wye Valley electric blanket*
3. *Hurseal washable bed sheet*
4. *Electric Bedwarmers "Bedtime Bliss" blankets*
5. *"New Popular" blanket (Dowsing)*
6. *David Griffin "Dee-Gee" electric blanket with control unit*
7. *Stanley Bros. "Cumfee" electric blanket*



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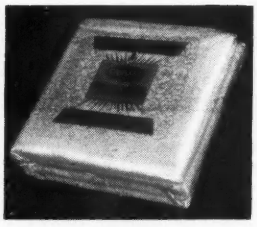

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Gillott Electro Appliances state that for the coming space heating season they are concentrating on one model only of their "Cotswold" fan heater which will supersede the present standard and de-luxe models. The new model is similar in appearance and colour to the de-luxe model, but the price has been reduced. The indicator lamp is retained but the two-speed motor has been dispensed with because the company is able to offer a much quieter motor than hitherto. The stand has been modified and is of tubular steel construction, and the cut-out is now of the replaceable link pattern and not manually re-settable.

Wall heaters, portable heaters and special nursery heaters are manufactured by Hobourn Domestic Appliances, Ltd., in addition to their range of "Ocean" oil-filled radiators, varying in size from 720 W to 1½ kW. The company also manufacture several different models of wall heaters for special installations.

Although not strictly speaking an appliance which would normally come under the heading "space heating," the electric blanket provides a most satisfactory form of heating during the night hours, and it is a comforting and warming thought that when one retires for the night it is to a warm bed. There are, of course, many manufacturers of electric blankets, more than we have space to mention here, but full details may be found in our issue of 24th August.

Milliwatt, Ltd., not only specialise in the standard blanket but also electrically heated foot-muffs, gloves, eye and ear pads, flying suits, etc. The Warm-Glow Co., announce a new cord switch specifically designed by them for their single-heat blankets. In view of the fact that an electric blanket does not immediately show that it is switched on, having neither lamp nor motor, it is desirable to give the user an indication on the switch. For this purpose a neon lamp is provided which glows when the switch is on. It has a protected recessed dolly so that it can only be operated deliberately.

The "Warranty" blankets and pads incorporate a heat control in the form of a specially developed switch built into the outer connection cable. This "Magic Brain" switch, fitted with pilot lamp, allows the blanket to be set to any temperature from "off" to "maximum heat." Fluctuations of voltage or room temperature are automatically taken account of by the switch, maintaining the blanket at the desired warmth. A neon indicating cord switch, designed mainly for use with electric blankets, has also recently been introduced by Crater Products.

With the Wye Valley Hand Weavers' blanket the inner core is made entirely by hand, the asbestos covered heating elements being woven in at the time as the core is being made. The low wattage of Stanley Bros. "Cumfee" blankets makes them economical and safe in operation and the company's double size "Cosy" blanket has a specially wired 3-position switch which in the "low" position gives a gentle warmth, particularly suitable for the elderly.

Modern Electrical Industries 5-heat conversion unit is designed to enable the "Warmabed" blanket to run at temperatures which vary according to the position of the control knob on the unit case. The neon lamp, by its brightness as well as the position of the switch, gives an indication of the temperature of the blanket. Large, medium and junior sizes are available in the H. J. Baldwin "Thermat" range of blankets, including quilted de-luxe and popular fleecy models. The company also produce a de-luxe 3-heat pad with detachable floral, quilted, sateen cover for local heat application purposes.

A full sized pure wool electric blanket which tucks in with the other bedclothes, and is used as an ordinary blanket until required to warm the bed, is the Isopad "Lana" (B.S.I. "Kite" mark). Dowsing & Co. offer the "New Popular" blanket, both in single and double bed sizes, and Electric Bedwarmers' "Bedtime Bliss" blankets are claimed to be the only blankets made with "Calomatique Z" long-life heating elements. According to

Thos. French & Sons the secret of the efficiency of their "Vesta" blanket lies in its new design. The extra length of the heating elements supplies a gently suffused warmth throughout the whole area of the blanket, yet consumption is low and the temperature does not rise above 130 deg F. A combination of stainless steel wire woven into a flexible glass fibre tape provides the heating elements.

A type which will no doubt make a strong appeal to nervously inclined people is the David Griffin "Dee Gee" safety blanket which does not operate direct from the mains, a control unit providing a 12 V supply. A 3-heat switch is fitted.

A firm not mentioned in our survey of blankets, E. F. Allchin & Co., announce that they are now marketing the "Buerer" range of blankets and pads as well as the new "Hadi" electric mattresses. The mattresses are in two types, the standard single-heat 30 by 50in model and the de-luxe of similar size with a 3-heat switch.

WATER HEATING

TO have a supply of really hot water on tap brings added comfort and convenience to the home in many ways. What is generally considered to be the cheapest and simplest method of supplementing an existing solid fuel water heating system by electric operation is the immersion heater. There are twenty-five or so manufacturers in this field offering models to cover most of the variations likely to be encountered in domestic plumbing systems. All sizes of storage tanks are catered for, the length of the normal immersion heater ranging from 10 to 36in.

The large number of thermal storage water heaters in use is an indication of their efficiency and as a means of providing the daily hot water requirements at the sink for cooking and washing-up purposes they are invaluable. Manufacturers offering a choice of all types are Santon, Ltd., who produce a very wide range of immersion heaters and both cistern and pressure type thermal storage water heaters. Typical of these is the Santon "Monmouth" dual, quick-service storage heater. This is one of the pressure types and is for supplying hot water to two or more points by plumbing to standard taps. Two heaters are fitted, for sink or bath, and the capacity is 20 gal. A 12 gal "Junior Monmouth" is also available. A new 2 gal sink heater, of contemporary design in many colour variations, was announced by Santon earlier this year. It has a loading of 1 kW and incorporates a fixed setting thermostat.

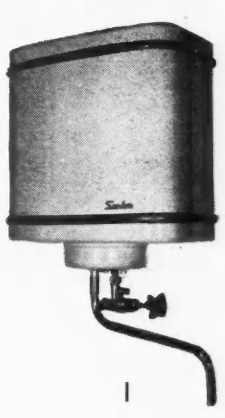
There is a choice of four colours, light blue, light green, parchment and gleaming white, for the Aidas "Sadia Select" 3 gal sink heater. All fittings are finished in chromium and the loading is 1 kW. Aidas also have a 1½ gal model, type G, in addition to the larger 20 gal pressure types and a wide selection of immersion heaters. Included in the latter range is the Aidas "Dumpy" which with only 1¼in projection, as opposed to the normal 3 to 4in, fits into confined spaces where hitherto fixing was awkward or impossible.

The Hotpoint "Dulec" water heater is a fully automatic model which combines two hot water systems in one, providing for the immediate supply of small or large quantities as required by the use of two separate thermostatically controlled banks of heating elements. The upper part has a loading of 500 W and provides approximately 6 gal of hot water, whilst in the lower part (2,500 W) approximately 18½ gal of hot water may be obtained, sufficient for the washday or bath night. The Hotpoint "Twinimerser," as with standard immersion heaters, may be automatically controlled, but unlike other dual-purpose heaters it requires only one thermostat and incorporates a change-over switch. It is provided with two "Torribar" elements, a 10in 2 kW element and a 36in element loaded at 3 kW. This longer element may be bent back on site to intermediate lengths down to 24in.

"Dulec" type water heaters are also obtainable from British National Electrics, Ltd. ("Charlton Twin") in 20 or 30 gal sizes, G.E.C., 20 gal size only, Simplex, 18½ gal and Duncan Low, 20, 30 and 40 gal sizes. Every dual-purpose storage water heater which bears the "Dulec" registered trade mark is manufactured in accordance with the "Dulec" standards of quality and that all its components are interchangeable with the components of any other "Dulec" heater.

Although no bigger in size than most 1½ gal models, the Simplex Creda "Crusader" holds a full 3 gal of water. This saving of space is achieved by the Creda exclusive lagging system and by a 2 kW element which gives a generous reserve of power to ensure quick recovery when water is drawn off.

W. H. Smith (Eziot), Ltd., produce 1½ and 2 gal non-pressure type water heaters for single point use over the sink or washbasin as well as a larger 12 gal size built-in cistern type for direct connection to taps.



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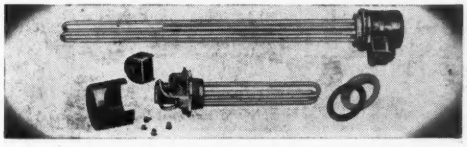
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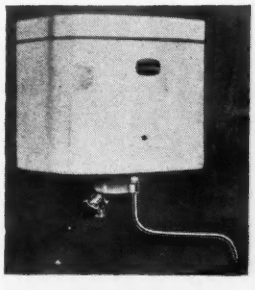

1. *Santon 2 gal sink heater*
2. *"Hotway" rapid water heater (Campbell)*
3. *Aidas 10½in 2 kW "Dumpy" immersion heater*
4. *Simplex Creda "Crusader" 3 gal water heater*
5. *Geo. Bray & Co.'s type LAMS immersion heater*

Campbell Engineering Co.'s "Hot-way" rapid water heater is controlled by a single knob and the electrical switch is automatic. When the knob is rotated the water valve is opened and water passes through dual channels simultaneously. Water flowing through the container is heated by immersion type elements and passes out through the outlet pipe, and the water entering the switch chamber maintains sufficient pressure to complete the electrical circuit through the contacts whilst the water flows. There is absolutely no electrical connection between the water and electrical circuits.

Just over twelve months ago a new fully automatic water heater was designed by Mitchell Electric, Ltd. Since this first model was produced they have made several improvements and are now going into full production. It is available in two sizes, 1½ and 3 gal, and the respective loadings are 750 W and 1 kW.

To provide greater adaptability and to reduce servicing problems the Gillott "Duo-Coil" vertical type immersion heaters with 2¼ B.S.P. heads are fitted with a dual type of thermostat pocket which will accept either the company's standard "Microstat" or the "Satchwell" or Maclaren thermostats. The type LAMS immersion heaters marketed by Geo. Bray & Co. have two sheathed wire elements and are fitted with an easy wiring terminal box that enables the contractor to keep his cables as far away as possible from the heated zone. This prevents a certain amount of trouble experienced in hot situations in airing cupboards where cables tend to vulcanise and the insulation to crack away. The company's other type LAQD is a similar heater but is fitted with only one sheathed wire element.

A choice of loadings is available (750 or 1,000 W) for the Heatrae "Lido" 1½ or 3 gal water heater. Finished in four stoved synthetic enamel colours, with black ebonised base and chromium fittings, this latest Heatrae range is neat in appearance and a new concealed fixing system simplifies fitting and cuts installation costs. Eltron, Ltd., also produce a fairly wide range of immersion heaters and in addition various portable units for heating small quantities of water in unheated washing machines, small containers, loft tanks, etc.

LAUNDRY

JUDGING by the number of different types and sizes of electric washing machines, wash boilers, irons and ironers, spin dryers, drying cabinets, etc., that are now available for home laundry requirements it would appear that the housewife is better catered for in this branch of household activities than in any other. This is perhaps not so surprising when it is realised that in this country it is estimated that 60 per cent of the housewives do home washing; in the North of England the figure is even greater.

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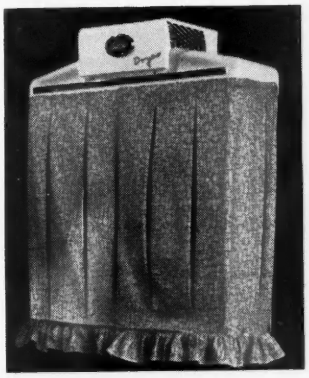
Undoubtedly one of the most noticeable tendencies in home laundry equipment during the past twelve months is the growth in the number of spin dryers. Claimed to be the first British made spin dryer, the Simplex Creda "Debonair" has been produced to meet the demand that exists for this type of apparatus. Drying is achieved by the application of centrifugal force created by spinning at high speed the inner container into which the clothes are dropped dripping wet. The clothes are flattened against the wall of the container and the pressure created squeezes the water out of holes which enable the water to escape and flow out through a rubber spout. After only a few minutes' spinning the bulk of the washing can be ironed at once straight from the machine. It has a capacity of 6 lb dry weight and has been so designed that it will not operate unless the lid is closed and locked. Mobility too is an important essential in an appliance of this kind and by mounting the base on two fixed rubber feet and two rubber wheels, not only is full stability achieved but by slightly tilting it can be wheeled effortlessly away for stowage purposes.

Another new portable spin dryer has been recently placed on the market by Chilton Electric Products. Roomy enough to dry an average washing machine load, it stands only 23in high and weighs 21 lb. With this machine it is claimed that within six minutes 95 per cent of the moisture is removed and the clothes are ready for ironing. The same principle of drying is employed for the Edy spin dryer available from Edy (Gt. Britain), Ltd., which will dry 22 lb of wet washing within a few minutes. This company also market a drying cabinet fitted with heater and ventilator, and a range of washing machines including the "Final" which is combined with a spin dryer.

Whilst on the subject of spin dryers mention must also be made of the Morphy-Richards model. It can handle a normal load of washing at a time, yet takes up very little space in the kitchen. It measures 25in high and the loading is 350 W. Finish is white enamel.

Just recently Morphy-Richards have announced that they have acquired the "Oprim" electric rotary ironer, thus making their range of home laundry finishing appliances now almost com-

1. *Chilton portable spin dryer*
2. *Simplex Creda "Debonair" model*
3. *Edy "Minor"*
4. *Morphy-Richards spin dryer*



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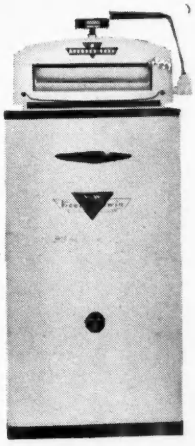

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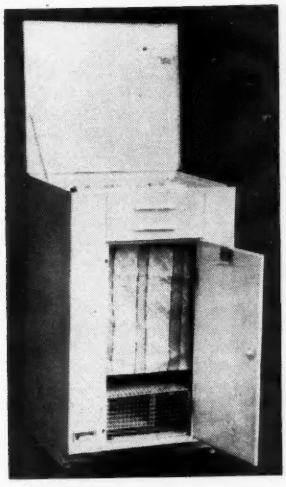

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plete. The company already produce electric hand irons, including a steam type.

Whether the wet summer has had any influence on the choice of new products recently announced by manufacturers is not known, but yet another clothes dryer has made it appearance within the past few weeks. As opposed to the spin dryer, the Wilkins & Mitchell "Servis" clothes dryer and airer is a heated model and takes up no floor space at all having been designed to hang on a wall. A black heat type element and fan, both enclosed in a metal grille, are situated at the top of the machine and clothes hang naturally from fold-away racks. The racks can accommodate the equivalent of 20 to 30ft of clothes line. There is a choice of four coloured fabrics in gay patterns to cover the sides and doors.

A simple but effective clothes dryer has been introduced by the Modern Equipment Co. Consisting of a 1 kW metal cased heater measuring 21 by 12in and 6in high, it is provided with an extending wooden rack which is mounted directly above the heater. With this new "Nippy-Nappy" dryer the rack is so constructed that articles of clothing which may hang at the sides and ends form their own walls, thus keeping the heat inside. The heater is fitted with a pre-heat thermostat and a large amount of clothes can be dried at one time, the bars having an equivalent of 36ft of clothes line.

The Victor Manufacturing Co. have introduced their "Major" clothes dryer, replacing the standard model. The cabinet has been redesigned and the performance has been considerably improved by the introduction of two special 750 W black heat elements controlled by a 10 A switch. It is fitted with six plastic rods, equal to 10ft of clothes line, and a stainless steel working top is available as an optional extra. It is provided with a pilot light and the finish is in cream or white. Colours are available to special order. Only a very small amount of floor space is occupied by the Coventry Radiator "Dryette" dryer and airer which is designed to fold away when not in use.

The Thos. Dryden "Drydenair" drying and airing cabinet is fitted with rubber tyred ball-bearing castors for easy movement and may also be used as a hotcupboard for warming plates, etc. The construction is of rustless metal finished in either cream or white

1. *Wilkins & Mitchell "Servis" wall mounting clothes dryer and airer*
2. *"Laundmaster" vibrosonic washing machine (Syndi Manufacturing Co.)*
3. *Viceroy "Twin" washing machine*
4. *Victor "Major" clothes dryer*
5. *Hoover Mk III washing machine with heater*
6. *"Catto" Products washing machine*
7. *Creston "Century" washing machine*
8. *Easiclene model EW3*

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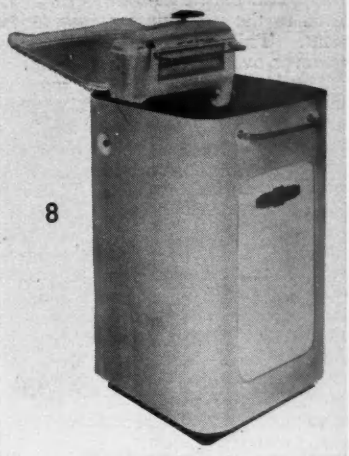

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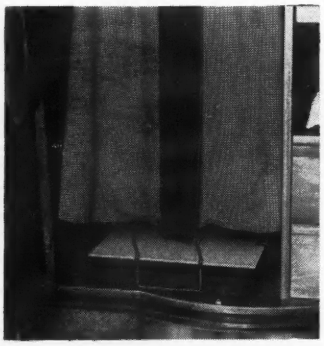

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The new "Viceroy Twin" electric washer is for clothes or dish cleansing, and included in a number of accessories available is a dish washing basket made of polythene plastics. Powered by a ¼ h.p. motor it has a capacity of 10 gal of water and 5 lb of dry clothes, and construction is of steel with an aluminium inner container. Finish is in white stoved enamel with black and cream accessories. A 12in hand wringer is also available for this machine in addition to a 2 or 3 kW heater.

Four washing machines are offered by Easiclene Porcelain Enamel, two of which are heated. The company's model EW.3 is provided with a fold-away power operated wringer and towel rail. There is a wide colour range for all models, including cream, eau-de-nil, light blue, black, red and the conventional white. The Creston "Century" cabinet styled machine also has a contrast in colours. Green, blue and red tops are available with white or cream cabinets. This machine is fully automatic and is provided with a 12in powered "Acme" wringer and a pump which is claimed to empty the container within two minutes. It has a capacity of 6 lb of clothes in 6½ gal of water, and the total consumption is 250 W. A rotary ironer with 26in roller may also be obtained for this machine. A full-size drying cabinet completes the company's range of home laundry equipment.

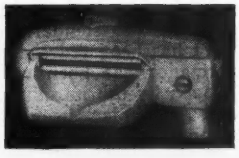
Both heated and unheated washing machines are produced by Entwisle & Kenyon, who include in their range of "Ewbank" washers what is claimed to be the only washer with a folding powered wringer. Two models of this type are available, the PW.10 (unheated) and the PW.11. In addition to the power wringer both are fitted with a pump and a special feature is the table top which can be had in either enamelled finish or "Formica." The big self-emptying tub of the Ada Mark I de-luxe model takes 8½ lb of dry clothes and its power driven wringer can be used in four positions, and has a variable pressure screw for quick readjustment. A store cupboard for the wringer is provided on this model. The company's Mark IV model takes a load of 4½ lb of dry clothes and like the de-luxe model is fitted with a powered wringer and self-emptying pump. Interchangeable with the wringers on these machines is the Ada rotary ironer. It has only one control; the operating lever brings the shoe to bear on the clothes and causes the drum to rotate at the same time, leaving both hands free.

A new "vibrosonic" type washing machine is now being marketed in this country by the Syndi Manufacturing Co. Working on the principle of washing by vibration, the "Laundmaster"

enamel, and the fold-away rail is chromium plated.

The fitting of a heater is now generally accepted as being standard for most makes of washing machines, and almost all washing machine manufacturers include a heated model or models in their range. Hoover, Ltd., have introduced a version of their Mark III washing machine incorporating a 2 kW immersion type heater. This has been set at the bottom of the tub behind the grille and has been done without altering the size of the machine or tub. It also has a detachable power operated wringer and pump, and plastic moulded wheels are fitted to the machine for easy movement. This Mark III machine is, however, available without a heater.

The latest heated washing machine of the Hotpoint Electric Appliance Co. is the model "HB" which has been designed for the smaller kitchen, but retains the essential advantages of the more expensive models. Water is heated by a 1½ kW "Torribar" immersion heater fitted with safety cut-out and placed beneath the gyrator in the recessed bottom of the bowl. Water capacity is 8½ gal and the machine will take 5 lb of dry clothes. There are push-button controls for the motor and heater with distinctively coloured on and off buttons. An automatic pump is fitted and the hand-operated wringer folds away neatly when not in use.



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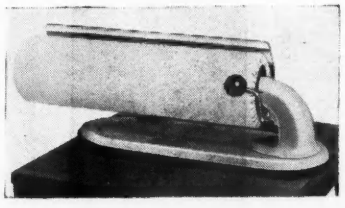

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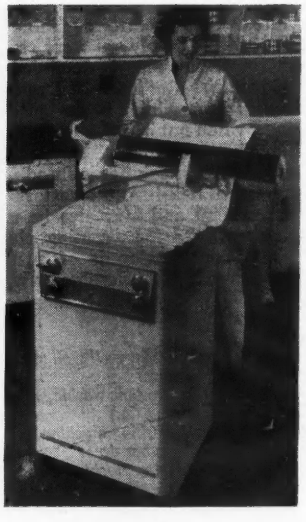

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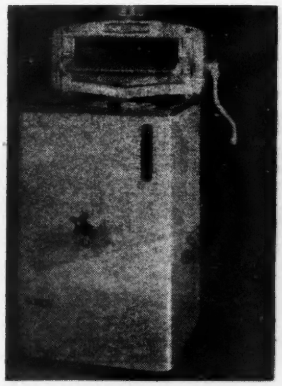
1. *H. G. Poxon "Herga" wardrobe airer*
2. *Ada pedestal model rotary ironer*
3. *Acme power wringer*
4. *Hotpoint portable rotary ironer*
5. *English Electric model 4005 washing machine fitted with rotary ironer*
6. *Premier "Nine-O-Nine" iron*



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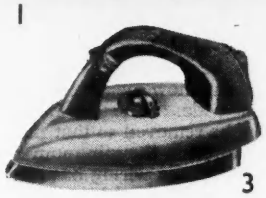

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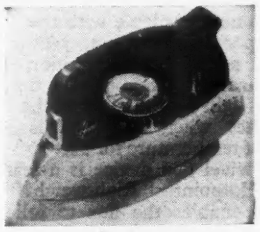

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1. *South Wales Switchgear model 354 wash boiler*
2. *Vactric model V77 with wringer attached*
3. *Metway automatic iron*
4. *Hoover "Steam-or-Dry" iron*
5. *Darlaston Galvanised Holloware Co.'s "Red Label" 4½ gal wash boiler*
6. *Bradley "Beldray" 4½ gal clothes boiler*

makes use of the sink into which the clothes are placed. After filling the sink with hot water and adding the necessary soap powder or detergent, the machine is placed on top of the clothes and switched on. Electricity supply is obtained through a 6 V transformer, thus providing complete safety in operation. As big a wash as the sink will reasonably hold can be tackled at one time and after ten minutes the water is changed and rinsing carried out for a further minute. When not in use the machine is compact enough to be stored in any convenient cupboard and the price, with transformer, and including purchase tax, is less than £28.

Another portable type which utilises the sink for washing is made by Carefree Domestic Appliances, Ltd. It has several of the advantages of the conventional washer and operates by water movement alone, impeller blades circulating the water powerfully through the clothes. It can also serve the purpose of a dish washer.

Several of the John Senior "Joy" washing machines are fitted with an automatic pump and reversible wringer and with the exception of standard machines, there is storage space underneath for the wringer. Some are also heated and all are available in a variety of colours, but the standard finishes are cream or white. Special features of the Summerscales "Fairy" washing machine are a 12in folding wringer and a dry clothes capacity of 8 lb. It can be supplied with or without a 3 kW heater. An automatic wash timing device is an added aid to housewives who can leave the machine unattended knowing that as soon as the operation is completed the washer automatically ceases to function.

Probably of equal importance as an item of home laundry equipment, providing as it does a useful supply of hot water both quickly and conveniently for the many housewives who prefer to boil their clothes, the electric wash boiler must not be overlooked. Two new wash boiler models, 353 and 354, are now being manufactured by South Wales Switchgear, Ltd. The former is a cabinet type of 10 gal capacity mounted on four castors and heat control is obtained by press-button switches. The 354 is similar but has an "Acme" 14in wringer. Both are supplied with vitreous enamelled top covers. A new type of tap is incorporated in these models. The company also continues its series of round wash boilers, a special feature of these being a roller in the rear leg for ease of movement, and a hand agitator which is an optional extra. The stove enamelled models are now available in powder blue or red, as well as cream or white finishes.

Hand agitators are also fitted to the Vactric V.77 wash boiler. This machine has a 10in wringer which folds away inside the boiler when not required and a vitreous enamelled table top that provides an extra working surface in the kitchen. There is also a smaller model, the Vactric V.45, with a capacity of 7 gal.

Probably one of the largest ranges of wash boilers is manufactured by Burco. The "Baby Burco" is a 5 gal model consisting of a spun aluminium container and enamel plinth. The whole measures less than 20in high and the weight is only 10 lb. At the other end of the scale there is a large 16 gal wash boiler rated at 4·5 kW. The company manufacture both cabinet and round types in addition to heated washing machines.

A feature of the Brunlec model 500F cabinet type wash boiler is its exclusive "Smoothline" draw-off tap which is turned on by opening a small drop-down door. Three-heat control is provided by push-button switches and the boiler has a capacity of about 10 gal. Vitreous enamelled and galvanised round types are also included in this company's range.

Several manufacturers make the smaller 4½ gal galvanised clothes washers, including Bradley & Co. ("Beldray"), Lamb Hingley & Co. ("Apex"), Monarch Electric ("Handiwash") and Bulpitt ("600"), etc., but as far as we are aware, only one manufacturer, the Darlaston Galvanised Holloware Co., offers them, with its range of "Red Label" boilers, in ex-

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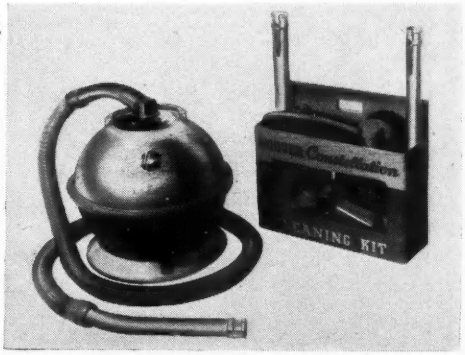
ternal colour finishes as an alternative to the plain galvanised finish.

An almost indispensable item of laundry equipment is the electric iron and there are well over thirty manufacturers making all types. Among these are automatic and non-automatic models, travelling irons, steam irons, and a type that is proving quite popular now, lightweight models. One of the lightweight types is the G.E.C. "Bride's" iron which is probably one of the lightest at 2½ lb. Only slightly heavier is the Morphy-Richards "Atlantic," models of which may be obtained for either a.c. or a.c./d.c. No other manufacturers have entered the steam-iron field, and Kenwood Electrics, Morphy-Richards and Hoover continue to offer their respective models. The "Revo Automatic" iron is now available with the body in four porcelain colours, yellow, blue, green and red, in addition to the standard chromium plated finish. A signal light in the side of the handle indicates when the iron is at the correct temperature for use.

A swivel flex device is a feature of the Hotpoint "Rightweight" iron, which enables the flex to follow the ironing movements naturally without kinking or getting in the way. Button nooks are provided in the toe, making the difficult ironing of buttoned garments easier. Hotpoint also produce an electric table ironer. An improved version of this was announced earlier in the year. The new appliance, which is known as model TE, now has an ironing shoe of extruded section aluminium alloy and is squared at both ends. The ironing area has been retained at 266 sq in and the shoe now measures 26¼in long by 10in wide. The left-hand lever can now be removed so that the ironer can be stored in the minimum amount of space and the wiring has also been rearranged. The finish is in cream or white stoved enamel. In addition, Hotpoint manufacture a rotary ironer.

As will have been gathered from the foregoing, "Acme" power wringers are fitted to several different makes of washing machines, but in addition the manufacturers, Acme Wringers, Ltd., market their own powered wringer in stand form. The wringer head can be swung into any of four working positions and it is fitted with automatic reversible rollers and drain allowing for wringing in either direction. The power wringer unit is contained in the base which is mounted on four wheels. The finish is lustrous white enamel.



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1. *Electrix "Sterling" vacuum cleaner fitted with stair climbing skids*
2. *Hotpoint model 420 vacuum cleaner*
3. *Falk Stadelmann "Cleanette" hand cleaner*
4. *Hoover "Constellation" vacuum cleaner with cleaning kit*

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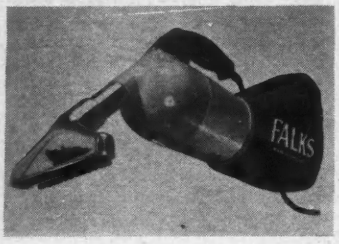

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CLEANING

WITH the aid of an electric vacuum cleaner the cleaning of a house presents little difficulty nowadays and with its use the necessity for dusting is considerably reduced as all the dirt goes into the dust-bag of the cleaner and is not allowed to settle elsewhere in the room.

Including the cylinder and upright models, hand types, etc., there are upwards of sixty different cleaners from which to make a choice, but obviously this must depend on individual requirements. Where it is necessary to continually deal with staircases, walls, furniture, etc., the cylinder model with all its attachments and greater manœuvrability will probably be most suitable but for the larger home, with greater expanse of floor space and carpeting the upright model may well be favoured.

A really new cleaner which has only appeared on the market during the past month is the Hoover "Constellation," which is neither cylindrical nor upright but spherical in style. Powerful and highly efficient in action, it is nevertheless very compact and is only just over 12in high. The flex winds round the base and it can be stored easily. The cleaner is equipped with the new "double-stretch" "Hooverflex" hose and with the addition of two aluminium alloy extension tubes it easily reaches up or down the stairs, turning on a swivel on top of the cleaner and cleaning up to 1,000 sq ft of surface without the cleaner being moved at all. A range of cleaning tools comprises carpet nozzle, floor brush, furniture brush, and dusting brush and crevice tool. An adjustable "Disposall" paper bag is fitted for easy and hygienic emptying of the dust and to allow for the fitting and removal of this the cleaner is hinged in the middle. In use the air is exhausted at the base and dispersed through silencing baffles. A convenient carrying handle is fitted and powerful suction is provided by a 510 W Hoover motor, fitted in the base and controlled by a foot

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switch. The finish is in light and dark blue and grey with foot switch and emblems in red.

Hoover, of course, continue with their other successful range of cleaners which includes the "Junior" model 119, specially designed for the smaller type of home, the model 417 cylinder cleaner and the later version of their standard upright cleaner, model 638. Special features of the Hoover "Dustette" hand cleaner include a strap which fits through a slot in the carrying handle enabling it to be slung over the shoulder when in use. It is also supplied with an extension tube, flexible cleaning hose, two cleaning brushes and a crevice tool.

One of the more useful accessories of the model 55 Electrolux cleaner is a sprayer which may be used for spraying many kinds of fluid such as carpet and upholstery cleansers, disinfectants, distemper, paint, etc. The Electrolux model 48 has been designed as a handy cleaner for the smaller home. An inner air sleeve dust bag is incorporated in the new model 420 upright cleaner introduced by Hotpoint. The handle can be angled to reach under furniture and beds without any adjustments; this handle is now finished in grey as is the base casting, and the bag and flexible are maroon coloured. A plastic bumper band is incorporated.

The General Electric Co. produce both a cylinder and an upright model, each with a full set of brushes and nozzles, and grey and maroon is chosen for the finish. A cleaner which is fitted with patented stair skids is the Electrix "Sterling." This allows the cleaner to rest on any of the stair treads and also to be pulled up by means of the hose which is so fixed that it will not become detached. The "Swiftclean" and "Halcyon" are other cylinder models produced by Electrix, who also manufacture a three-brush floor polisher.

Operation is facilitated by a footpress switch on the Sloan Electrical Co.'s "Super Summit" cylinder model. A special swivel on the cleaner end of the flexible hose permits easy movement of the hose and prevents fraying. After 21 years the "Summit" cylinder cleaner has been redesigned and incorporates many improvements including radio and television suppressors. A useful companion to the upright cleaner is the new "Summit" hand vacuum cleaner which is supplied in a pleasing finish of cream and brown. The weight of 4 lb has been carefully distributed to prevent undue fatigue to the user, and the plastic handle affords a comfortable grip and embodies a convenient slide-action on/off switch. The accessories can be fitted either direct to the cleaner or used in conjunction with the extension tubes.

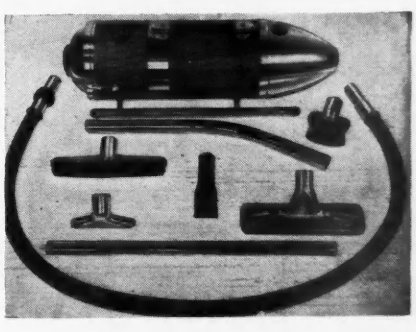
Several models are available from Phœnix Sales, Ltd., whose range includes five cylinder models and the square-sided "Power-Flo" cleaner. Vacuums "Bustler" has a simple broom like action and is fitted with a 29in extension tube which can be removed if desired, enabling it to be used as a hand cleaner, while the "Tellus" has neither inside nor outside dust bag; it collects the dirt in a roomy metal container. By this method, it is claimed, the suction is never restricted and it is also easier for emptying purposes.

A reasonably priced machine with powerful suction, the "Cadison," is obtainable from R. Cadisch & Sons who also produce a small hand model. Crown Appliances produce the "Sentinel" models 200 and 300, the latter being fitted with a nozzle which will automatically adjust itself to the user's height. A wide range of vacuum cleaners is also available from the Co-operative Wholesale Society whose "Invincible" models include upright, cylinder and portable types.

A lightweight hand cleaner of new design for curtains, stair carpets, car interiors, etc., is the model H.12228 Drake & Gorham "Dragor." This company also offer two cylinder models and an upright version. Among other manufacturers of hand cleaners are the Siroma Engineering Co., Brown Brothers ("Duco"), Falk, Stadelmann ("Cleanette") and Bylock ("Minivac").

Bylock Distributors have announced their new "Poly Whirl" brush suction floor polisher attachment which has been designed to fit the majority of cylinder type vacuum cleaners. It has two brushes and draws up any dirt or dust and polishes in one operation. The casing is finished in grey and red polystyrene and it is fitted with adjustable sleeves to accept the varying sizes of standard wands. Electrolux also produce a turbo-polishing attachment which works off their model 55 suction cleaner. With this attachment there are two sets of brushes, one for spreading the polish and one for polishing, a felt pad and a sheeps-wool buffer.

For the polishing of larger floor areas there is the new Electrolux B.9 polisher. This model, announced by the company earlier in the year, replaces their previous B.6 polisher and incorporates several modifications.



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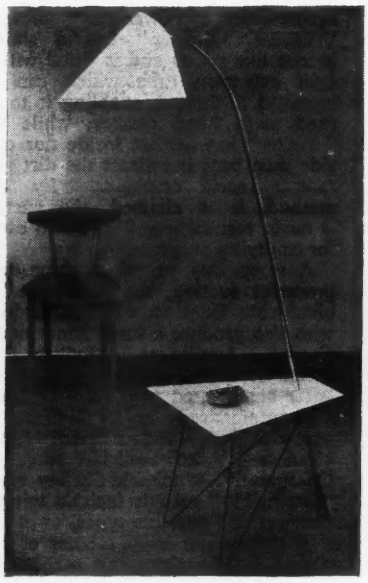
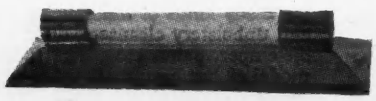
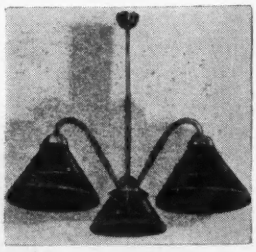
1. *Bylock "Polywhirl" suction floor polisher*
2. *G.E.C. DM380 upright cleaner*
3. *Electrolux B.9 floor polisher*
4. *Sloan "Super Summit" vacuum cleaner with accessories*

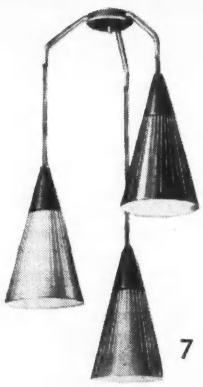






One of these is the floating suspension of the brushes which makes them self-adjusting to floor irregularities. Another is an automatic built-in switch which prevents the polisher from being operated when the handle is upright in the locked position. The upper cable holder is turnable and a flick of the finger instantly releases the entire cable. It includes a set of hard brushes for polish spreading, one of soft brushes for polishing and felt discs for high gloss finishing.

With the addition of scrubbing brushes the Hoover polisher becomes an effective and labour-saving scrubber. Its construction provides for polishing beneath furniture, while a lamp shining through a grille in the front points out unpolished areas. A combined scrubber/polisher is also obtainable from Vactric, Ltd.



1. *Oswald Hollman combined coffee table and floor standard*
2. *Linolite SA.2 decorative fitting*
3. *Linealux fitting No. 726 (with switch)*
4. *T. B. Morley 3-light pendant fitting No. 9719*
5. *Selection of Chas. F. Bristol & Son's "Flosmaron" pottery table lamps*
6. *Falk Stadelmann "Argus" 1-light bracket fitting*
7. *Berry's M.18/G.5 3-light pendant fitting*

LIGHTING

ONE of the earliest forms of decorative lighting was the simple lampshade and it still remains probably the most popular. The very wide range of contemporary designs that are now on the market proves this point.

It is now several years since Falk, Stadelmann & Co. produced a series of lighting fittings which anticipated this trend in architecture known as "contemporary," and their new season's range of fittings and designs combine a broad conception of modern lighting. Typical of these is the "Pleiades" diabolo type pendant fittings. This fitting is suspended by means of white circular flexible and is available in both 5- and 8-light forms. The metalwork is of brass and spun aluminium and the reflectors are cherry red, off-white or blue/grey on the outside with white interior. A 2-light matching fitting, either as a bracket or pendant fitting, is also made to the same specifications. A feature of the 2-light pendant is that by using these in a group the equivalent of a multiple-light fitting may be made up. Materials and colour combine to make the Falks "Argus" a gay and lively fitting available in 5- and 3-light forms with matching 2- and 1-light brackets.

Berry's Electric offer a very wide range of contemporary lighting fittings. Among their latest designs is a 3-light pendant fitting (M.11/G.10) which has a spread of 20in. The metalwork is of grey with red ceiling cup and centre plate. Standard glassware has a white background with red patches and grey figuring. Another fitting, illustrated here, is the M.18/G.5. This is also a 3-light pendant type that has a drop of 23in and an 18in spread. The metalwork is similar to the previously mentioned fitting and the glassware is in red or yellow with white lines.

Among the fittings which are offered by Osler & Faraday are several of the electrolier type, in wood and wrought iron, ceiling and wall lights, desk lights, floor and table lamps, etc. As designers and manufacturers of electric light fittings, table standards and lampshades, Oswald Hollman, Ltd., offer a varied range which includes pottery base standards with fabric lined parchment shades as well as a novel combined standard and coffee table. Moderately priced contemporary fittings suitable for the small home are made by T. B. Morley & Co. Their latest range comprises four 3-light pendants, one 5-light cluster set and one 3-light cluster set, and two sets of matching wall brackets which can be used either as 2-light or 1-light fittings. The glassware is either green or orange coloured and is washable.

The glass panels making up the shades of the Dernier & Hamlyn "Neolux" fittings are easily removable, thereby simplifying packing and assembly, and lessening the chances of breakages in transit. Glassware is also favoured by the Osborn Manufacturing Co. Their "Cobra" 3-light contemporary styled pendant fitting has

chromium metalwork and the glassware is of attractive design in champagne or pink. This company also manufacture several types of hall lanterns in brass, or oxidised copper. Whether one prefers soft diffused lighting or bright concentrated light there are models specially designed to meet all needs in the C.W.S. "Dudley" range. All of their fittings can be supplied without glassware if required.

The newest domestic table lamps available from Chas. F. Bristol & Son are offered in a wide assortment of colours, including such combinations as a white ground with assorted coloured splashes, pottery black with white rings or pottery white with black stripes and green, wine or yellow top. All the shades to match this range of fittings are of parchment. Table lamps, bed lights, fittings, lampshades (including "Nylux" shades) and a wide range of new fabric shades in modern and contemporary styles are listed in Knightshades' new season's catalogue. An unusually attractive item is their 1873 bracket fitting for two lamps. In this the metalwork is finished in ivory, red, mustard, or black or white with polka dots.

Carved wood period lighting fittings are made by John Bowen Fittings, Ltd., and Payne & Penny, Ltd., who also specialise in period reproduction work, while for those who favour wrought iron fittings, Thomas Haywood & Sons offer a wide selection. All the company's ornamental ironwork is hand made at the Falcon Forge from which the fittings derive their name.

High-class Venetian glass wrought iron ware is now being manufactured and marketed by Harris & Sheldon, makers of the "Handslite" range of lighting equipment. Three styles are being produced, the "Grecian," "Jacobean" and "Vestry," and each is available in complete matching suites comprising pendants, ceiling lights, hall lanterns, table standards, wall brackets, etc. Pink, amber, opal and clear glass colours are available.

Another company specialising in hand-made goods is the Derby Alabaster Art Products Co. whose new range of "Angelo" table lamps are made from the finest selected English alabaster with a natural pink veining running through it. Apart from the pleasing designs, the highly polished finish that can be obtained with this material requires only an occasional rub over to renew its high gloss.

The Rowlands Electrical Accessories, Ltd., plinth light provides unlimited scope for artistic expression and its soft radiance makes it an ideal illumination for halls and stairways, as well as an unobtrusive light for televiewers. Vases of flowers and goldfish bowls can be placed over this type of fitting with delightful effect. They are obtainable in five colours and each is supplied complete with b.c. porcelain lampholder, 3 yd flexible and a glass top plate.

"Perspex" possesses very good light transmission qualities and Wraithe Bros. use this material to advantage in their wide range of lighting units. Being also light in weight these fittings can be hung in a few seconds from any existing lampholder, and only an occasional rinse in hot soapy water is needed to restore their original lustre. Several original designs have been added to the autumn range of Homeshades lighting fittings. Washable silk lampshades that are both removable and collapsible are marketed by G. & S. Wright, Ltd., under the name "Formashayd." Priced at only about half the cost of their equivalent conventional lampshades, they may be placed on the frame whilst wet for washing purposes and left to dry. A special setting of the ribs is claimed to eliminate wire shadow.

The sturdy all-plastic Benjamin "Coolicon" shade can be used almost everywhere and is as serviceable as it is

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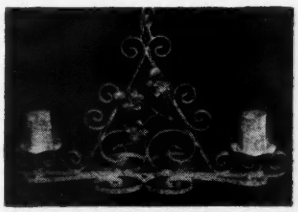
1. *Rowlands Electrical Accessories "R.E.A.L." plinth light*
2. *G.B.M. (Electrical) "Moseley" 2-light wrought-iron ceiling fitting*
3. *Philament 1050/G411 6-light ceiling fitting*
4. *Osborn Manufacturing Co.'s "Cobra" 1024/204 3-light ceiling fitting*
5. *"Falcon Forge" 4-light wrought iron ceiling fitting (Thos. Haywood)*
6. *Combined T.V. and reading lamp (Derby Alabaster (Arts Products) Co.)*
7. *Knightshades 1873 2-lamp bracket fitting*
8. *Homeshade Co.'s 4-light wall fitting*



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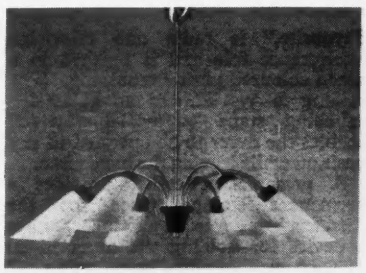

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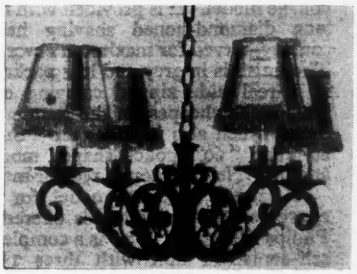

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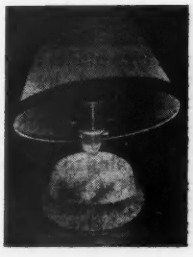

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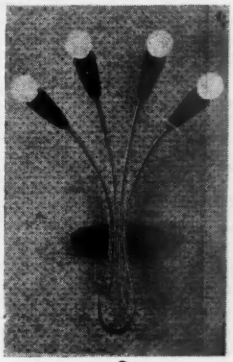

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smart. No screws are required for fixing and the shades fit all standard b.c. lampholders. Whilst the actual shades are white, the galleries can be supplied in white, blue, green or black, which will generally blend with most colour schemes.

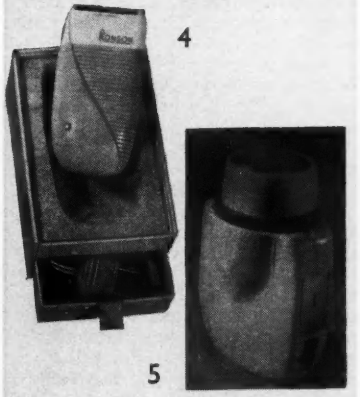
Tubular lamps can produce simple yet pleasing decorative effects. The Linolite SA.2 fitting, which was introduced a month or two ago, is an entirely new development and comprises a range of two unshaded fittings, SA.1 and SA.2, and two shaded fittings, SA.4 and SA.5, both switched and unswitched respectively. The latter incorporate a new form of fabric shade which is available in an attractive range of candy stripe colours. The shade itself plugs into holes in the fitting and is replaceable. The finish of the fittings is chromium, gold or stove enamelled ivory. The company also produce several clip-on mirror light fittings, suitable for the bathroom or dressing table, in addition to a clip-on bedlight fitting. The Linealux "700" series of striplight fittings are moulded in six colours, white, cream, eau-de-nil, ivory, pearl grey and pink and are recommended for use with 30 W lamps.

MISCELLANEOUS

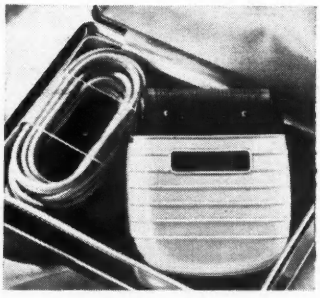
THE smaller miscellaneous electrical appliances that are available for domestic use are many and varied and while we shall attempt to describe a few it will be appreciated that all cannot be covered in the space available. From the feminine point of view an almost indispensable item of domestic electrical equipment is the hair dryer, and from the dozen or so manufacturers producing this type of apparatus there can be obtained models to suit all tastes. Their modern streamlined design and the fact that the majority are made of a plastic moulding renders them completely shockproof and safe in operation.

Weight plays an important part in an appliance of this nature and the average is in the region of 2 to $2\frac{1}{2}$ lb. Even lighter in weight, just under 1 lb, is the Falks U.95731, a model supplied complete with a leatherette pouch for travelling purposes. It is available in pink or blue pastel shades or in a lustrous porcelain ivory finish and measures only $5\frac{1}{2}$in overall. A similar lightweight model is obtainable from the Bestfrend Electrical Co., while Electrothermal Engineering, Ltd., market several "Solis" models weighing between $1\frac{1}{4}$ and $1\frac{3}{4}$ lb each.

A new lightweight model of exceptionally attractive appearance, well-balanced and especially designed to avoid the possibility of overheating has just been announced by Brown Brothers. The hair dryer, the "Duco Favourite," is radio and television interference free and is finished in a peach coloured plastic moulding. The loading is 375 W and an adjustable matching stand is available which enables the dryer to be operated in any position while leaving the hands free.



1. *Pifco electric hair-curling tongs*
2. *Brown Brothers "Duco Favourite" hair dryer*
3. *Arvin "Fernbrook" dry shaver*
4. *Ronson "Lady" electric dry shaver*
5. *B. H. Ries "Richard Cadet" dry shaver*



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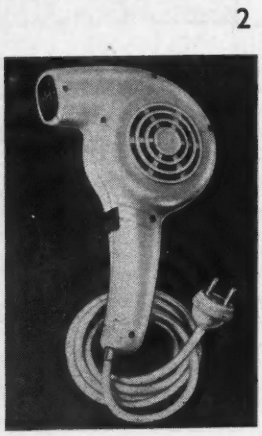


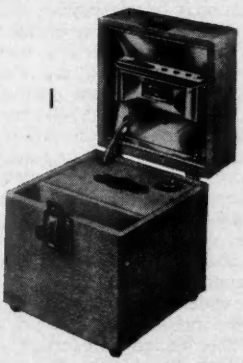
A presentation casket provides a permanent storage place for the Siemens hair dryer. It also incorporates a device for holding the dryer in an upright position while in operation. A silent induction type motor is employed in the Morphy-Richards noiseless model.

A useful attachment suitable for converting a normal domestic hair dryer into a hood type model for home use has been produced by L. G. Hawkins during the past year. It consists of a two-piece tubular plastic stem, the bottom of which is fitted with a metal clamp for attaching to a table top, etc., a plastic hood and a metal air deflector. When in use the hair dryer is fixed to the top tubular support by means of clips and one end of the hood is slipped over the end of the hair dryer nozzle while the other fits over the head. Ventilation holes are provided in the hood. Although designed for the Hawkins "Supreme" hair dryer the attachment is also suitable for fitting to most other makes. Pifco, Ltd., also produce a similar type of attachment.

A recent announcement of Pifco states that they have commenced production of electric hair curling tongs, an appliance which as far as we are aware has not appeared on the market in this country since before the war. The tongs are fitted with chromium plated blades and the handle always remains cool. A plastic button on the end of the clamp blade facilitates opening and closing. The overall length is 10in and the tongs are supplied complete with an enamelled metal stand.

Apart from the convenience of being able to shave wherever an electricity supply is available, the electric dry shaver has several advantages which commend it to the user, and models are produced for use on standard a.c. or d.c. supplies, ranging from 100/250 V, 6 or 12 V battery models for car owners and even a $4\frac{1}{2}$ V model suitable for operation by a flash-lamp battery. The latest dry shaver to be announced by Remington is the "Four-Most" dual voltage model. It is provided with four long diamond-honed shaving heads, contour-curved for maximum coverage. The finish is in grey and it is packaged in a real hide zipped carrying case. This is the cheapest in the Remington range which also includes the "Super 60" and "60" pouch shaped models, and the "New Contour" regular model.

A battery operated model for the convenience of travellers is offered by Philips Electrical. This is a completely self-contained unit with three $1\frac{1}{2}$ V batteries contained in a separate case. A mirror is also provided. The shaver



1. *"Sol-Tan" 99P portable ultra-violet sunlamp (London Commercial Electrical Stores)*
2. *Remington "Four-Most" dry shaver*
3. *Smiths "Autocal" self-starting alarm clock*
4. *Lumsden models I.R.140 (left) and I.R.145 infra-red ray lamps*

itself incorporates a "Bi-Ax" shaving head with rotary action similar to that employed for the mains operated "Philishave." The new Arvin "Fernbrook" incorporates a motor without a friction bearing surface and it is claimed that noise and vibration are reduced to the minimum. It is a foil shaver with the outer shear of stainless steel measuring only 0·002in thick. The Arvin "33" is powered by a dual voltage a.c./d.c. motor and can be supplied in ranges covering 200/250 V and 100/125 V or 200/250 V and 12 V.

Rolls Razors offer the "Viceroy" V-Ten with a voltage range for world-wide use (90/250 V a.c./d.c., 25/100 c/s). The company also produce a handy set of three electrical plug adaptors for use with their shavers and other electrical apparatus with English standard 5 A 2-pin plugs, adapting to U.S.A. flat 2-pin plugs, Continental 2-pin plugs or Edison screw cap (medium).

Ronson, whose name has long been associated with the manufacture of cigarette lighters, already produce a vibrator type dry shaver and have announced the introduction of the "Lady Ronson" dry shaver. The first models are due to appear this month.

A handy sized rotary head model fitted with a powerful motor is one of the latest to be offered by B. H. Ries, Ltd. This shaver, the "Richard Cadet," has an ivory plastic body and weighs 10 oz. The voltage range is 110/130 and 200/250 a.c./d.c.

A five-year free service guarantee is offered by Sunbeam Electric with their "Shavemaster" which has a powerful brush-type, series wound motor, 16-bar armature, and nylon crankshaft driven mechanism. Dual voltage models are available.

From Switzerland come the "Unic-54" and the round headed "Unic Vedette," which are distributed in this country by Haynor, Ltd. The latter model has a rim round the circular sieve head which acts as a cutting comb for moustache trimming; 12 V models for cars are also available.

Shaving can be facilitated by the use of an illuminated mirror and the Pifco "Mirolite" magnifying mirror with internal illumination provides a bright shadowless reflection. It can be made to hang or stand anywhere and an ivory plastic case and frame houses the 15 W bulb. Of similar construction is the Pifco "Razorlite" which in addition to serving as an illuminated magnifying shaving mirror is provided with a built-in socket for an electric shaver. The Coalport Metalware magnifying mirror is double-sided and incorporates a push-button switch for illumination purposes on one side of its base and on the other a socket to take a dry shaver.

Specially designed to enable people to give themselves, or their children,

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regular sun-ray and infra-red treatment at home, the Pifco "Sunmaster" mercury quartz sun lamp allows ultra-violet or infra-red rays to be used either independently or together. Housed in a cream enamel case with hinged doors, it measures 9in square by 3¼in deep and is suitable for either table or wall mounting. The loading is 400 W.

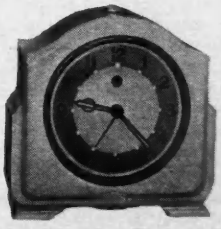
Infra-red ray appliances are also manufactured by the Ergon Electrical Manufacturing Co. and the latest addition to their range is the Ergon "Junior" prescription model. It consists basically of a 10in diameter aluminium reflector and a combined infra-red and radiant heat generator with a loading of approximately 450 W. Chalfont Electrical Products have entered this market and offer a 9in prescription model fitted with a 400 W mixed wave generator. The "Healthway Three" 10½in medical lamp is one of the latest appliances to be announced by Metway Electrical Industries. For this a 250 W infra-red heating element is employed.

Other suppliers of this type of equipment are Watson & Sons (Electro-Medical), Ltd., who have for many years specialised in the production of ultra-violet and infra-red apparatus. The London Commercial Electrical Stores, who market the "Sol-Tan" range of ultra-violet lamps, both table and floor models, inform us that they have a new portable sunlamp, model 99P, in the early stages of production. The lamp is claimed to be competitively priced and highly efficient. The extra high pressure mercury arc is generated within a tube of transparent quartz which contains two activated electrodes, a third auxiliary electrode serving to start the arc automatically as soon as the lamp is switched on. Maximum intensity is reached after about three minutes. Attractive in appearance, it is housed in a strong laminated wood cabinet covered in grey lizard leather cloth. It measures 6¾in square by 7½in deep, weighing just under 11 lb.

A 9in radiant heat lamp is also available from Electro-Medical Blankets, Ltd., while the Lumsden Lamp Co. include quartz mercury vapour types in their range.

Now that power cuts are almost a thing of the past the demand for electric clocks has grown. Additional models as well as new developments are frequently introduced by Smiths Clocks & Watches, Ltd., to keep step with contemporary trends and the latest additions to their range are many and varied. This company's "Sectric" alarm clocks remain as popular as ever.

Ferranti, Ltd., produce an unusual wall clock (model 189) with a 10in square dial in a walnut veneered case



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with inlaid sycamore chaplets and exposed gilt hands. Wood and decorative mantel clocks with coloured or transparent tinted "Perspex" panels are also included in this company's range, in addition to a neat alarm clock with a 24-hour setting. A new self-starting electric wall clock, the "Gay," has been introduced by Westclox, Ltd. It has a 7in dial with large easy-to-read white figures and minute markings. It is available in three dial colours, sunset red, cedar green and autumn brown. The numerals are glazed into the glass face so that they will not rub off and an external knob allows the clock hands to be set without removing it from the wall. This company also announce that they hope soon to produce two further models and later, an alarm clock.

Style is the keynote of a new range of Timex thin electric clocks. This slimness is made possible by a new design of motor. Three models are available, two styles of wall clock and one mantel. Model X01 wall clock has an 8in circular plastic case with a depth of only 2in, and is available in red, white and yellow. The other wall clock, model X02, is similar in shape but has three-dimensional metallised figures which show through a smooth plastic surface. The finish of this clock is in white, charcoal, and red. The mantel or occasional clock, model X03, is housed in a wooden case with polished brass trim and measures 5in square and only 1⅝in deep.

A new alarm clock, model 840, is being produced by Metamec, Ltd. This is in two styles and the finish is bright copper and chromium. The dial and hands are luminous.

The use of a loudspeaking intercommunication system has numerous applications in the home and was, in fact, specially designed in the first instance to provide a simple and inexpensive means of communication with the servants' quarters, etc. In recent years, however, it has become popular as a "baby warning" device between the nursery and living-room. A complete equipment consisting of a master unit and a single substation unit is available from Easco Electrical. The Dulci Co.'s system comprises a nursery unit in a neat leatherette covered cabinet into which is fitted the microphone. This is also provided with an on/off pilot indicator light. A loudspeaker is contained in the parent unit. Any type of twin wire may be used to any length and the total consumption is 15 W.

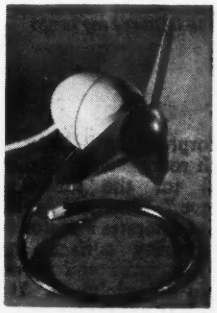
A 3½in loudspeaker and a microphone which may be positioned up to 100ft from the main unit without impairing its efficiency is incorporated in the Premier Radio Co.'s alarm. Similar apparatus, the "Cri-Call" baby alarm, is available from Hifi, Ltd.

Another convenience for the busy mother is an electric bottle heater designed to heat a baby's food to the right temperature and to keep it at that temperature until it is required. The David Griffin "Dee Gee" bottle heater is suitable for all standard feeding bottles and bedside tumblers, and has a normal consumption of 165 W. Two or three tablespoonfuls of water are first placed into the heater followed by the bottle and it is then left ready for switching on and heating whenever it may be required during the night hours.

The problem of domestic ventilation is not solved by opening and closing windows. Proper control of ventilation is essential and this applies more so to the kitchen than any other room. A window ventilating fan removes cooking smells and steam direct to the outside air. Typical of this type of fan is the Vent-Axia model which is available in several types. Type "X" moves the air in one direction only and is supplied separately as type "X" extract or type "X" intake.

The G.E.C. produce their 7½in "Xpelair" window fan with a moulded plastic impeller which is claimed to prevent amplification of any magnetic noise which may be present in the motor at certain speeds. Keith Blackman also produce a window fan, the "Extravent," as well as a 16in diameter stand-mounted circulating fan suitable for domestic use. Whilst on the subject of kitchen ventilation, mention may also be made of the Fenton, Byrne domestic kitchen ventilation unit. Constructed of 20-gauge steel and measuring 2ft by 2ft 6in by 1ft 5in, it is in the form of a canopy designed to fit over the cooker. In the canopy is a 9in extractor fan which when in use passes the steam and cooking smells into the outside atmosphere through louvres fitted into the wall. As ventilating engineers this company produce a wide range of this type of equipment including a 9in window fan and a rubber bladed table fan.

Apart from the window fan, table or wall types are as popular as ever and the Limit Engineering Group offer models ranging in size from 10 to 16in, in addition to a pedestal model with



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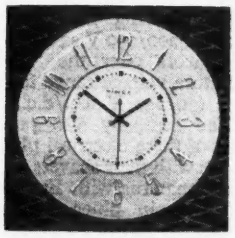

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1. Austin Clarke "Cygnet" fan. 2. Wolf "Cub" No. 12 portable saw and groover. 3. Jones & Stevens "Dragonfly" electric fan. 4. Timex model X02 electric wall clock

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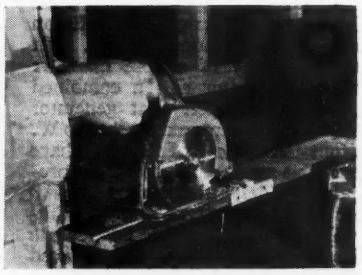

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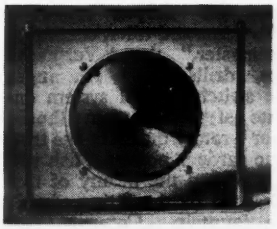
12in diameter blades. A small size domestic fan giving an air displacement of approximately 560 cu ft/min is available from Austin Clarke (London), Ltd. This new fan, the "Cygnet," is 8in in diameter and the three blades are made from a polythene moulding as a precaution against accidents. The motor is housed in a two-piece plastic moulding in various colours and it can be used in a standing position or as a wall fixing in four different positions.

Claimed to be the most inexpensive fan at present on the market, the Jones & Stevens "Dragonfly" is of modern design and is suitable as a personal fan or for domestic use. This also embodies moulded blades, with a 6½in sweep, and the finish is in red and

cream. The whole unit is mounted on a coiled polished metal stand.

Tack Air Conditioning, Ltd., produces a device, the "Saxane Moloniser" for getting rid of flies. It is designed for wall mounting and has no moving parts. A 40 W heating element is thermostatically controlled to operate at a low temperature. Into the unit is placed insecticide and the manufacturers claim that a single charge will deal effectively with a content of up to 5,000 cu ft.

To the home handyman a portable electric drill is a great asset, and the accessories which are now available



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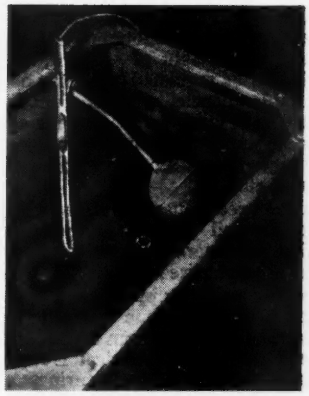

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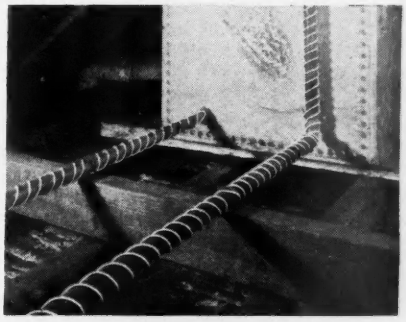

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1. Ferranti model 553 decorative mantel clock. 2. Eltron anti-freeze heater fitted in a domestic water storage tank. 3. Partridge Wilson "Davenset" junior model home battery charger. 4. Electrothermal Engineering anti-freeze heater shown protecting the cold water feed pipes of a loft water storage tank

for use in conjunction with these drills are such that a complete power workshop can be built up. The latest additions to the Wolf Electric Tools "Cub" range are a portable saw and groover attachment, a paint mixer and a hedge trimmer. The saw attachment is fitted with a 5in diameter rip and cross-cut blade which apart from being suitable for making straight and bevel cuts of up to 45 deg, can be adjusted by means of two pairs of washers so that grooves up to $\frac{3}{8}$in in width can be made. A spring-loaded safety guard is fitted. The paint mixer has a $\frac{1}{4}$in shank to suit the "Cub" drill chuck, while the hedge trimmer is of the oscillating type and has a blade length of 10in; its operation speed is 850 strokes a minute. The large diversity of attachments made by Black & Decker, Ltd., for use with their $\frac{1}{4}$in "Utility" drill includes a sander/polisher kit, lathe saw table, screwdriver, paint mixer, hedge trimmer and pruner, etc. Two new drills have been added to this "Utility" line; these are a $\frac{1}{4}$in de-luxe drill (U.3) and a $\frac{3}{8}$in drill (U.15).

The S. N. Bridges general purpose "Toolpower" $\frac{1}{4}$in drill forms the nucleus of every Bridges home workshop kit; such kits include equipment for power drilling, turning, sanding, sawing, grinding, polishing, etc. In addition various smaller workshop kits are available from this company enabling users to start with the exact equipment to meet their current needs. One of the latest accessories to the "Toolpower" home workshop range to be introduced is a 6in portable circular saw attachment, the "Nu-Rip." Of die-cast alloy construction, the saw is capable of ripping or cross-cutting timber $1\frac{1}{2}$in thick and the mitring gauge is calibrated in single degrees up to 45 deg. A retractable saw guard automatically covers the blade when a cut is complete thus ensuring complete safety in use.

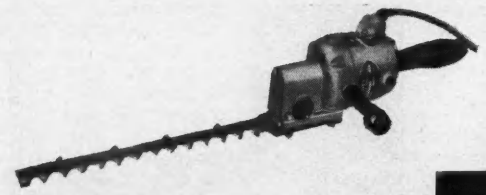
For the handyman with a fair amount of paintwork or fruit spraying to do in a year, the Burgess Products "Vibro" sprayer will probably prove of interest. It has an instantly adjustable spray control incorporated in its pistol-grip handle and a nozzle adaptor for upward or downward spraying.

With winter rapidly approaching and memories of last year's bursts still fresh in everybody's mind, now is the time to ensure that all exposed pipes are adequately protected against frost. Felting or boarding the roof and lagging the tank is the generally accepted method that has been practised for many years, but more recently it has become possible to make use of electricity to guarantee freedom from pipe freeze-ups. Electrothermal Engineering's anti-freezer consists of a 30ft length of plastic covered heating cable which is simply coiled round the cold water pipes and connected to the mains supply. As it consumes only about 75 W and it is only necessary to switch on during frosty weather, the running costs are negligible. In the case of very long pipe runs, two or more anti-freezers may be connected in parallel. Any existing lagging, which is removed before fixing, must not be replaced as the heating cable will itself provide complete protection against freezing. An economical electric pipe heating cable which can be laid along or wrapped round pipes wherever they may be vulnerable to frost has also been evolved by the Warm-Glow Co.

An anti-freeze heater which takes the form of an immersion heater has been placed on the market this season by Eltron (London), Ltd. This has a loading of 100 W and is designed to hang over the ball cock or over the side of the water cistern. With this method it is claimed that sufficient heat is made available to prevent drips on the ball cock freezing, thus interfering with the flow of water, and also to prevent ice forming on the actual surface of the cistern. The price of this heater is under £2.

Domestic applications of electricity need not be confined to the house. Much of the hard work involved in lawn mowing can be avoided by the use of an electrically propelled lawnmower. As far as we are aware, no new models have appeared on the market, but several makes such as the Webb 12in and 14in models, and the J.P. Engineering Co.'s "Super" in 14 and 16in sizes and the "Maxees" 12in and "Monarch" 12 and 14in models retain their popularity. With regard to the "Super" models, we would mention that provision is made for this machine to be used as an entirely self-propelled model, or with the motor driving the cutters only. This type is appreciated when cutting round garden beds and up to rockeries.

The Alpha Machine Tools "Lawnmaster" conversion unit is a motorised unit designed to convert any popular make of roller/mower to electric power drive. The manufacturers claim that it can be fitted within half-an-hour and no special tools or mechanical experience are required.



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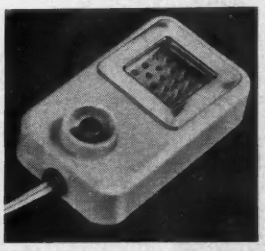

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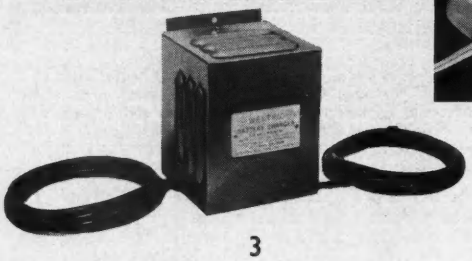

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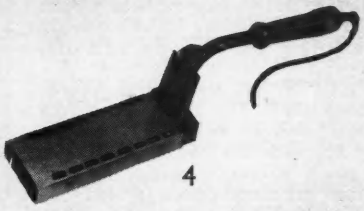

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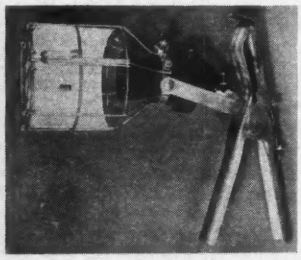

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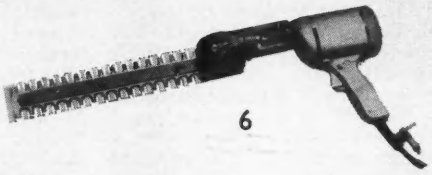

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1. *Tarpen hedge trimmer*
2. *Truvox "Belark" electric cigarette lighter*
3. *Westinghouse "Westric" battery charger*
4. *Kindler Electric Co.'s electric firelighter*
5. *Barries "Stadium" garage inspection lamp*
6. *S. N. Bridges "Toolpower" drill fitted with hedge-trimmer attachment*
7. *Skarsten electric paint stripper and scraper*
8. *Stokes garden fountain pump (right) shown with the de-luxe "Hotel" model*

A quick and easy job of hedge trimming can be accomplished with the aid of an electric hedge trimmer, and models available are both safe and effortless to use. The Tarpen Engineering Co.'s "Tarpentrimmer" is suitable for operation from both a.c. and d.c. supplies, but as is the case with any electric tool operated from a.c., it is desirable not to use a voltage in excess of 110 V and for this purpose a Tarpen double-wound transformer can be obtained. Low voltage models are also available for use from a car battery and for the very large garden where long distances make the use of a mains supply less applicable, power may be obtained from a generator. The latter can also be used to operate other tools in the Tarpen range which includes a hoe and tiller, chain saw, the "Grassmaster," the "Vergemaster," sanders, drills, etc. An ingenious double switch control system ensures absolute safety when using the Bylock "Senior" rotary model hedge trimmer.

Some gardens possess a fish pond or small pool and the beauty of this can be enhanced by the fitting of a Stokes garden fountain. Compact, trouble-free and inexpensive to run, it is only necessary to stand the pump assembly in the water, plug into the nearest supply point and the fountain will send a spray to a height of 5 to 6ft. The height can be regulated by means of an adjustable nozzle, and it functions quite well in water no deeper than 5½in. This company also has a range of fountains for indoor table use, aquaria, etc.

In the greenhouse the value of electricity for soil warming purposes and heating in general is too well known for us to emphasise here.

Electric paint strippers are a useful accessory for the home decorator and models are available from several firms including Baronet Electrical Developments, Osborn Manufacturing, the Skarsten Manufacturing Co., etc. The latter company announces that its last model is fitted with an enclosed "Inconel" type of element which is claimed to last almost indefinitely and is immune to all fumes given off by paint surfaces.

Nothing can be more exasperating on a cold morning than trying to start a car which has a "flat" battery. An easy cure for this is a home car battery charger. The Westinghouse Brake & Signal Co.'s "Westric" charger is designed for mounting on the garage wall. It has a nominal output of 2 A and is designed to charge either a 6 or 12 V battery. The F. C. Heayberd "Popular" 1 A charger incorporates full wave metal rectification and is supplied with an ammeter to indicate the charging rate. As the rating is only about 22 W a power point is not necessary when installing. Two "Davenset" home battery chargers are available from Partridge, Wilson & Co., the model "H" Mark II and the "Junior." This year the company announced that the model "H" has been improved

and the output has been increased to 3 A.

Whilst on the subject of garage equipment attention might also be drawn to the useful purpose served by electricity in the form of an engine pre-heater produced by Bertram Thomas (Engineers), Ltd. This is a simple device comprising a steel tray which encloses two heating elements. This is slid under the bonnet of a car overnight and keeps the radiator water and engine oil at normal temperature to prevent damage through freezing.

There is also a wide selection of garage inspection lamps on the market, and one of the latest to be announced is from Barries Electrical Agencies, Ltd. This is the "Stadium" multi-grip inspection lamp (model 260). The spring-loaded jaws are adjustable and the wire bulb protection cage is fitted with a white enamelled half reflector. A hinged top allows easy insertion of the bulb into a rubber shrouded b.c. lampholder. This lampholder is fitted with a push-pull switch.

There are, of course, several other electrical "gadgets" that we could mention here. Perhaps it is unfair to label these appliances as "gadgets" for they undoubtedly meet the requirements for which they are intended and serve a useful purpose in their own field. Such an appliance is the Kindler Electric Co.'s electric fire-lighter. It is claimed to be able to ignite coal in from 4 to 8 minutes, depending on the size of the coal used, and to start a good fire within 15 minutes. The elements are of special iron-aluminium-chromium alloy in a high refractory sheath protected by stainless steel. The loading is 700 W and 2½ yd of 3-core flexible cable is fitted.

Heat creasing for trousers, pleated skirts, etc., is a simple task with the aid of an electric presser, and the fact that this appliance has been on the market for a number of years is an indication of its popularity. The "Empire" trouser creaser, manufactured by Lighters, Ltd., is one such model and another is available from Pifco, Ltd. Incidentally, Pifco also market an electric tie press.

Although several types of cigarette lighters are available for use in a car, operated from a car battery, as far as we are aware only the Truvox "Belark" cigarette lighter operates direct from the mains at standard voltages. The lighter incorporates a heating element set behind the mica window finished with chrome trim, the whole being housed in an off-white plastic case. 6 or 12 V models are also available.

We are grateful to S. N. Bridges & Co., Ltd., the Simplex Electric Co., Ltd., the Electric Lamp Manufacturers' Association, Hurseal, Ltd., and the English Electric Co., Ltd., for the pictures used to introduce the various sections of this article reproduced on page 755.

Domestic Appliances and Their Makers

Full Names and Addresses are given on Page 782

Air Conditioners:—Biddle, Continental Components, Fenton Byrn, G.E.C., Industrial Humidifiers, Lec, Lightfoot, Tack, Temperature, Vent-Axia, Walter.

Baby Alarms:—Dulci, Easco, G.E.C., Hifi, Premier Radio.

Battery Chargers:—Banner, Crypton, Electric Construction Co., Easco, Edison Swan, G.E.C., Heayberd, I.R.L., Partridge Wilson, Premier Radio, Philips, Ray, Runbaken, Sax, Standard Telephone, Tarpen, Westinghouse.

Bedwarmers:—Belling, Blanella, Chalfont, Denhams, Electric Bedwarmers, Electro-Medical, G.E.C., Hall & Veret, Hope, Isopad, Milliwatt, Thermalux, Thermat, Thermega, Warranty.

Bells:—British General Mfg. Co., Falk Stadelmann, Friedland, G.E.C., Gent, Julius Sax, Ward & Goldstone.

Bellpushes, Illuminated:—Falk Stadelmann, Friedland, Telsen.

Blankets and Pads:—Allchin, Best, Bestfrend, Blanella, Bulpitt, Chalfont, Denhams, Dowsing, Easipower, Electric Bedwarmers, Electro-Medical, Engel, Falk Stadelmann, French, Griffin, Holt Engineering, Robt. Holt, Hope, Hotpoint, Hurseal, Isopad, Milliwatt, Modern Electrical, Morphy-Richards, Permaheat, Pifco, Premier, Stanley, Sutcliffe & Clarkson, Telsen, Thermalux, Thermat, Thermega, Thermolectrics, Thermoset, Warmex, Warmalux, Warm-Glow, Warranty, Wholesale Fittings Co., Windak, Wye Valley Hand Weavers, Yelsen.

Boiling Plates and Rings:—Backer, Belling, Bescol, Carron, Davidson, Dexray, Electroway, Engel, English Electric, Gatehill, G.E.C., Grafton, Grubb, Hotpoint, Isopad, Jackson, Metropolitan-Vickers, Metway, Pifco, Price, Reeves, Revo, Telsen, Tym's, Warnford.

Churns, Butter:—Blow, Churn.

Cigarette Lighters:—Truvox.

Clocks:—Derby Alabaster, Ferranti, G.E.C., Gent, McKellen (battery), Metamec, Ries, Smiths, Timex, Westclox.

Clothes Dryers and Airers:—Belling, Chalfont, Coventry Radiator, Edy, English Electric, E. K. Cole, G.E.C., Hounslow ("Chalex"), Hotpoint, Modern Equipment, Morphy-Richards, Poxon, Walter.

Coffee Mills:—Hillman, Sew-Tric.

Coffee Percolators:—Bescol, Best Products, Bulpitt, Cona, Davidson, Elga, Falk Stadelmann, G.E.C., Hotpoint, Lincass, Merlin, Pearl, Premier, Russell Hobbs, S.L.R., Tomlinson.

Convector Heaters:—Argosy, Artic Fuse, Belling, Benham, Berry's Electric, Bescol, Biddle, British National Electrics, E. K. Cole, Continental Components, Crosslands (Rugeley), Dexray, Dryden, Dulrae, Electroway, Falk Stadelmann, Fenton Byrn, Ferranti, Frost, G.E.C., Gillott, Grubb, Hawkins, H.M.V., Heatovent, Heatrae, Hobourn, Hounslow ("Chalex"), Hurseal, Jackson, Lossos, Midland Electric Mfg., Morphy-Richards, Pearl, Price, Reeves Electrical, Revo, Siemens Bros. Sutcliffe & Clarkson, Tack, Telsen, Bertram Thomas, Tividale, Unity.

Cookers:—Belling, British National Electrics, Carron, C.S.A. Industries, English Electric, Falco, G.E.C., Hawkins, Jackson, Moffats, Revo, Simplex ("Creda"), Tricity, Warnford.

Cookers, Breakfast:—Belling, British National Electrics, Carron, Dexray, G.E.C., Hawkins, Hounslow ("Chalex"), Jackson, Metway, Revo, Telsen, Tricity, Tym's, Warnford.

Darners, Illuminated:—Pifco.

Dish Washing Machines:—Ada, Carefree, Dishlex, Dishmaster, Parnall, Paul, Viceroy.

Door Chimes:—Friedland, Morphy-Richards, Telsen.

Drying Cabinets:—Ada, Belling, Chalfont, Coventry Radiator, Creston, Dryden, Edy, Euk, Fenton Byrn, Glover, Heatovent, Hotpoint, Hounslow ("Chalex"), Modern Equipment, Bertram Thomas, Warnford, Wilkins & Mitchell.

Egg Boilers:—Eltron, Hawkins.

Fan Heaters:—Aerex, Ashcroft Tools, Austin Clarke, Baker, Biddle, E. K. Cole, Collaro, Continental Components, E.R. Co., Fenton Byrn, G.E.C., Gillott, H.M.V., Heatovent, Hurseal, Key Leather, Lossos, Ozonair, Tack, Unity.

Fans:—Aerex, Airscrew (window), Austin Clarke, Biddle, Continental Components, E.R.Co., Falk Stadelmann, Fenton Byrn, Frost, G.E.C., Hillman, Hotpoint, Industrial Humidifiers, Jones & Stevens, Keith Blackman, Limit, Ozonair, Revo, Tack, Vent-Axia.

Feeding Bottle Heaters (Babies):—Churn, Griffin, Santos, Williams.

Fire Lighters:—Kindler.

Fires:—Artic Fuse, Belling, Berry's Electric, Bescol, British National Electrics, Bulpitt, Carron, C.W.S., Cradley, Cranmer & Cheshire, Crosslands (Rugeley), Davidson, Dexray, Dowsing, Electroway, Endo, Engel, Falco, Falk Stadelmann, Ferranti, Formo, Frost, G.B.M., Gatehill, G.E.C., Grafton, Grubb, H.M.V., Hawkins, Heatrae, Hotpoint, Hounslow ("Chalex"), Jackson, Metway, Midland Electric Mfg., Mitchell, Monarch, Morley, Morphy-Richards, Nico, Pearl, Pifco, Premier, Price, Reeves, Revo, Robin Hood, Sperryn, Sutcliffe & Clarkson, Telsen, Tym's Electric.

Floor Polishers:—Bridges, Bylock, Columbus-Dixon, Electrix, Electrolux, G.E.C., Hoover, Truvox, Vactric.

Floor Warming Equipment:—Calidec, Dulrae, Panelec, Thermodare, Tyrad, Warm-Glow.

Food Trolleys:—Blackburn, Hawkins, Jackson, Kaymet, Bertram Thomas.

Fountains:—Stokes.

Frying Pans:—Sunbeam.

Gaslighters:—Ever Ready, Horstmann, Pifco, Siemens Bros., Truvox, Vidor.

Greenhouse Heaters:—Berry's Electric, British National Electrics, Calidec, E. K. Cole, Fenton Byrn, G.E.C., Heatovent, Heatrae, Hurseal, Industrial Humidifiers, Roberts Electrical, Santon, Bertram Thomas, Unity, Wardle.

Grill, Infra-red:—Brattel, Engel, Infra-Heat, M.E.A.C., Warner, Warnford.

Grinders, Kitchen:—Hillman, Sew-Tric.

Hair Clippers:—Chilton, Fransen, Pifco.

Hair Dryers:—Alexander, Bestfrend, Brown Bros., Bylock, Electrothermal, Falk Stadelmann, Fransen, G.E.C., H.M.V., Hawkins, Hillman, Morphy-Richards, Ormond, Pifco, Siemens, Siroma.

Heat Pumps:—Ferranti.

Heating Panels:—Benham, E. K. Cole, Dexray, Dulrae, Electrothermal, Fenton Byrn, G.E.C., Heatovent, Isopad, Morphy-Richards, Panelec, Poxon, Tyrad, Unity.

Hedge Trimmers:—Black & Decker, Bridges, Bylock, Raylor, Tarpen, Wolf.

Immersion Heaters:—Aidas (" Sadia "), Backer, Belling, Benham, Berry's Electric, Bescol, Best Products, Bestfrend, Blackburn, Geo. Bray, British National Electrics, Bulpitt, Campbell, Chalfont, Continental Components, Controlled Heating Units (London), Davidson, Elga, Eltron, Falk Stadelmann, Ferranti, G.B.M., G.E.C., Gillott, Grubb, Heatrae, Hotpoint, Duncan Low, Metropolitan-Vickers, Metway, Mitchell, Morley, George Nobbs, Remploy, Santon, Simplex (" Creda "), Sperryn, Telsen.

Insect Killers:—Aerovap, Tack, Vulcan.

Ironers:—Ada, Creston, English Electric, G.E.C., Hotpoint, Morphy-Richards, Parnall, Wilkins & Mitchell.

Irons, Automatic:—Bylock, C.W.S., Easipower, Falk Stadelmann, G.E.C., Grafton, H.M.V., Hawkins, Homefyre, Hotpoint, I.R.L., Jelson, Lincass, Metway, Morphy-Richards, Pearl, Pifco, Premier, Price, Revo, Robson, Scottish Precision Engg., Telsen, Thorn, Tym's Electric.

Irons, Non-Automatic:—A.B. Metal Products, Brown Bros., Carron, C.W.S., Davidson, Dowsing, Falk Stadelmann, G.E.C., Grafton, Homefyre, I.R.L., Lincass, Metway, Pearl, Premier, Price, Robson, Scottish Precision Engg., Selex, Sims, Telsen, Tym's Electric, Westerman, Wholesale Fittings.

Irons, Cordless:—Donaldson, Dowsing, Walter.

Irons, Steam or Dry:—Hoover, Kenwood, Morphy-Richards.

Irons, Travelling:—A.B. Metal Products, Elga, Falk Stadelmann, G.E.C., Grafton, Lucas Holder, Metway, Morphy-Richards, Price, Robson, Sims, Telsen.

Kettles:—Bescol, Best Products, Bulpitt, Buncher & Haseler, Campbell, Chalfont, C.W.S., Davidson, Dependable Products, Easipower, Elga, Eltron (combined tea kettle), Falk Stadelmann, G.E.C., Grafton, Hawkins, Hotpoint, Lincass, Metway, Pearl, Pifco, Premier, Revo, Russell Hobbs, Stevens, Telsen, Tomlinson.

Kettles, Whistling:—Bescol, Best Products, Bestfrend, Bulpitt, Stevens.

Lawnmowers:—A.M.I. (" Ladybird "), Alpha (attachment), J.P., Nutt (" Hayn "), Shanks, Webb.

Lighting Fittings:—Allom, Allsopp & Booth, Ascog, Artic Fuse, Benjamin, Berry's, Best & Lloyd, Bristol, British General, Cone Fittings, C.W.S., Cranmer & Cheshire, Crosslands (Rugeley), Derby Alabaster, Dernier & Hamlyn, Dexray, Doughty, Downer, Edison Swan, Ekco-Ensign, Electric Art Shade, Ever Ready, Falcon Forge, Falk Stadelmann, Finmar, Forrest, Froylectric, G.B.M., G.E.C., Oswald Hollman, Homeshade, Hume Atkins, Kego, Kirolite, Knightshades, Linealux, Linolite, Loblite, Longford Electric, Maclamp, McGeoch, Martin, Merchant Adventurers, Metropolitan-Vickers, Metway, Morley, New Estate, Nico, Osborn (" Cobra "), Osler & Faraday, Payne & Penny, Pearl, Philament, Philips, Pifco, Quinnell, Rowlands, Siemens, Herman Smith Smithlite, Speights, Straight-Lite Reflectors, Telsen, Fredk. Thomas, Thorn, Troughton & Young, Ward & Goldstone, Wardle, Webb's Crystal Glass, Wholesale Fittings, Wraithe, Wright.

Massagers:—Fattelay & Sharp, Haynor, London Commercial Electrical Stores, Pifco.

Mattresses, Heated:—Allchin, Slumberland, Thermalux.

Medical Lamps:—Arora, Barber, Chalfont, Hanovia, Hope, London Commercial Electrical Stores, Electro-Medical, Engel, Lumsden, Metway, Perihel, Philips, Pifco, Raysol, Walker, Warnford, Watson.

Mixers, Food and Drink:—Bridges, Brown Bros., English Electric, Falk Stadelmann, H.M.V., Hawkins, Haynor, Hillman, Kenwood, L.P. Patents, Midland Repetition, Siroma, Sunbeam, Valmade.

Ozonizers:—E.C.D., Ozonair, Walter.

Paint Strippers:—Baronet, Horvell, Osborn, Skarsten.

Plate Warmers:—Belling, Electrothermal, English Electric, G.E.C., Grafton, Heatrae, Hotpoint, Kaymet, Premier, Revo, Telsen, Bertram Thomas, Tricity, Warnford.

Radiators, Low Temperature:—Berrys, Dimplex, Dryden, Poxon, Unity.

Radiators, Water and Oil Filled:—Benham, Dimplex, Drydenair, G.B.M., Grubb, Hobourn, Hurseal, Industrial Humidifiers, Duncan Low, MacKey Bowley, Remploy, Santon, Steel Radiators.

Refrigerators:—Alaska, Balcombe, Coldette, Coldrator, C.S.A. Industries, Easiclene, Electrolux, English Electric, Frigidaire, G.E.C., Hotpoint, Lec Refrigeration, Lightfoot, Main, Morphy-Richards, Nash-Kelvinator, Pressed Steel (" Prestcold "), Wilkins & Mitchell (" Servis ").

Refuse Disposal Units, Sink:—Dishmaster, Haigh.

Sewing Machine Motors:—Carter, G.E.C., Hillman, London Commercial Electrical Stores, Parvalux, Sew-Tric.

Shavers:—Arvin, Chilton, Fransen, Haynor, Philips, Pifco, Remington, Ries, Rolls, Ronson, Sunbeam.

Shaving Mirrors, Illuminated:—Coalport, G.E.C., Pifco.

Soil-Heating Equipment:—Banner, Calidec, Chalfont, Electrothermal, G.E.C., Roberts Electrical, Siemens Bros., Unity, Warm-Glow.

Soldering Irons:—Acru, Adcola, Browning's Electric, G.E.C., Light Soldering Developments, Metal & Electro Chemicals, Metropolitan-Vickers, Premier Radio, Rawlplug, Remploy, Runbaken, Standard Telephones, Telsen, Wolf.

Spin Dryers:—Chilton, Edy, Morphy-Richards, Simplex.

Spits, Roasting:—Brattel, Infra-Heat, Warner, Walters.

Sprayers:—Burgess, Bylock, Columbus-Dixon.

Tea-Making Sets:—British Vacuum Cleaner & Engg. Co. (" Goblin "), Filtrite, Hawkins, Pifco, Pye, Smiths, Teesmade.

Toasters, Automatic:—Dualit, Elga, Falk Stadelmann, G.E.C., Morphy-Richards, Pifco.

Toasters, Non-Automatic:—A.B. Metal Products, Bulpitt, Davidson, Dualit, Easipower, G.E.C., Grafton, Hawkins, Homefyre, Hotpoint, I.R.L., New Forest Services, Ormond, Premier, Price, Reeves, Telsen.

Tools, Portable:—Black & Decker, Bridges, Electrix, Rawlplug, Tarpen, Wolf.

Towel Rails:—Belling, Benham, Dimplex, Dryden, Dulrae, G.B.M., Heatrae, Lan-Bar.

Trouser Creasers:—Falk Stadelmann, Lighters, Pifco.

Tubular Heaters:—Bescol, British National Electrics, Calidec, E. K. Cole, Electroway, Falk Stadelmann, G.E.C., Grubb, Heatovent, Heatrae, Hurseal, Metropolitan-Vickers, Bertram Thomas, Roberts Electrical, Siemens Bros., Unity, Wardle.

Utensils, Ground Base:—Bulpitt, Buncher & Haseler, Corfield-Sigg, Dependable Products, Easipower, G.E.C., Hague & McKenzie, Midland Metal Spinning, Pearl, Stevens, White Bros. & Jacobs.

Vacuum Cleaners, Canister:—British Vacuum Cleaner & Engg. Co. (" Goblin "), Bylock, Hoover, Tellus.

Vacuum Cleaners, Cylinder:—British Vacuum Cleaner & Engg. Co. (" Goblin "), Brown Bros., Bylock, Cadisch, C.W.S., Crown, Drake & Gorham, Electrix, Electrolux, Express, G.E.C., Hoover, Lonor, Phœnix, Siroma, Sloan, Taylor, Vactric.

Vacuum Cleaners, Hand:—British Vacuum Cleaner & Engg. Co. (" Goblin "), Brown Bros., Bylock, Cadisch, C.W.S., Drake & Gorham, Falk Stadelmann, Hoover, Siroma, Sloan, Taylor, Water Softener & Vacuum Cleaner Service (" Jifextra "), Vactric, Wholesale Fittings Co.

Vacuum Cleaners, Upright:—British Vacuum Cleaner & Engg. Co. (" Goblin "), Brown Bros., Columbus-Dixon, C.W.S., Drake & Gorham, G.E.C., Hoover, Hotpoint, Nash, Siroma, Sloan, Taylor, Vactric, Vacuums.

Waffle Irons:—Dualit, S.L.R.

Washboilers:—Alder, Amplec, Bradley, Brailsford, Brunlec, Bulpitt, Burco, Chalfont, C.W.S., Darlaston, Dugdale, G.E.C., Hawkins, Jackson, Lamb Hingley, Monarch, Simister, Herman Smith Smithlite, South Wales Switchgear, Tomlinson, Universal Boilers, Vactric.

Washing Machines:—Ada, Bendix, British Vacuum Cleaner & Engg. Co. (" Goblin "), Burco, Carefree, Clegg & Coupe, Cotto, Creston, Easicler.e, Edy, English Electric, Entwisle & Kenyon, G.E.C., Hoover, Hotpoint, Longford Electric, Parnall, Paul, Senior, Summerscales, Syndi, Universal Boilers, Viceroy, Wilkins & Mitchell.

Water Heaters, Instantaneous:—Campbell, Eltron, Telsen.

Water Heaters, Storage:—Aidas (" Sadia "), Berry's Electric, British National Electrics, Eltron, Ferranti, G.E.C., Heatrae, Hotpoint, Duncan Low, Mitchell, Santon, Simplex ("Creda"), W. H. Smith ("Eziot").

Wringing Machines:—Acme, Entwisle & Kenvon, Parnall. Summerscales.

Domestic Appliance Manufacturers

Names and Addresses of Firms Referred to in this Issue

A. B. Metal Products, Ltd., Ynysboeth, Abercynon, Glam.

A.M.I. Ladybird, Emmbrook Mill, Wokingham.

Acme Wringers, Ltd., David Street, Bridgeton, Glasgow.

Acru Electric Tool Mnfg. Co., Ltd., Chapel Street, Levenshulme, Manchester, 19.

Ada (Halifax), Ltd., Johnson Street, Halifax.

Adcola Products, Ltd., Gauden Road, Clapham High Street, London, S.W.4.

Aerex, Ltd., 6-7, New Bridge Street, London, E.C.4.

Aerovap Holdings, Ltd., 70-72, Jermyn Street, London, S.W.1.

Aidas Electric, Ltd., Sadia Works, Rowdell Road, Northolt, Greenford, Middlesex.

Airscrew Co. & Jicwood, Ltd., Weybridge.

Alaska Mfg. Co., Ltd., 75, Clarendon Road, Watford, Herts.

Alder Electrical Appliances, Ltd., Rushworth Street, Burnley, Lancs.

Alexander, Charles, & Co., Ltd., 74, Portsmouth Road, Surbiton, Surrey.

Allchin, E. F., & Co., 137, High Street, Aston, Birmingham, 6.

Allom Bros., Ltd., Lombard Road, London, S.W.16.

Allsopp & Booth, Ltd., Dudley Port, Tipton.

Alpha Machine (Tools), Ltd., Avenue Works, Gidea Park, Essex.

Amplec, Ltd., Grange Works, Grange Lane, Accrington.

Apsley Metal Products, 12, Shirland Mews, London, W.9.

Argosy Engineering, Ltd., Hertford Road, Barking, Essex.

Artic Fuse & Electrical Eng. Co., Ltd., Birtley, Co. Durham.

Arvin Electric Co., Ltd., High Street, Southend-on-Sea, Essex.

Ascog, Ltd., 44, Theobalds Road, London, W.C.1.

Ashcroft Tools, Ltd., Ashcroft Road, Cirencester, Glos.

Austin Clarke (London), Ltd., Champion Works, Newhaven, Sussex.

Backer Electric Co., Ltd., Fitzwilliam Road, Rotherham.

Baker, P. W., & Sons (Sales), Ltd., Mayhurst, Maybury, Woking.

Balcombe, A. J., Ltd., 52-58, Tabernacle Street, London, E.C.2.

Banner Electric Co., Ltd., Burford House, Hoddesdon.

Barber Electrical Services, Leach Street, Birmingham, 16.

Baronet Electrical Developments, 159, Alston Street, Ladywood, Birmingham, 16.
Belling & Co., Ltd., Bridge Works, Southbury Road, Enfield.
Bendix Home Appliances, Ltd., Albion Works, Kingsbury Road, Birmingham, 24.
Benham & Sons, Ltd., 66, Wigmore Street, London, W.1.
Benjamin Electric, Ltd., Brantwood Works, Tariff Road, London, N.17.
Berry's Electric, Ltd., Touchbutton House, Newman Street, London, W.1.
Bescol (Electric), Ltd., 118, Parkfield Road, Saltley, Birmingham, 8.
Best & Lloyd, Ltd., Wattville Road, Birmingham, 21.
Best Products, Ltd., Felix Works, Felixstowe.
Bestfrend Electrical Co., Ltd., Diceland Works, Banstead.
Biddle, F. H., Ltd., 16, Upper Grosvenor Street, London, W.1.
Black & Decker, Ltd., Harmondsworth, Middlesex.
Blackburn, C. H., & Co., Ltd., 10, Gray's Inn Road, London, W.C.1.
Blanella, Ltd., Boston Spa, Yorkshire.
Blow, J. J., Ltd., Oldfield Works, Chesterfield.
Bowen, John, Fittings, Ltd., 556-586, Kings Road, Chelsea, S.W.
Bradley & Co., Ltd., Albion Works, Mount Pleasant, Bilston, Staffs.
Brailsford Bros., Queens Road, Barnsley.
Brattel Electric Co., Ltd., 27, Old Bond Street, London, W.1.
Bray, Geo., & Co., Ltd., Leicester Place, Leeds, 2.
Bridges, S. N., & Co., Ltd., Parsons Green Lane, London, S.W.6.
Bristol, Chas. F., & Son, Ltd., 17-19, Lench Street, Birmingham, 4.
British General Mnfg. Co. (1941), Ltd., 38, Glasshill Street, London, S.E.1.
British National Electrics, Ltd., Newarthill, Motherwell, Lanarkshire.
British Vacuum Cleaner & Engg. Co., Ltd., Goblin Works, Leatherhead.
Brown Bros., Ltd., Great Eastern Street, London, E.C.2.
Browning's Electric Co., Ltd., Boleyn Castle, Green Street, Upton Park, London, E.13.
Brunlec Appliances, Ltd., Junction Street, Burnley, Lancs.
Bulpitt & Sons, Ltd., Icknield Street, Birmingham, 18.
Buncher & Haseler, Ltd., Branston Street, Birmingham, 18.
Burco, Ltd., Waterside Mill, Rose Grove, Burnley.
Burgess Products Co., Ltd., Hinckley, Leicester.
Bylock Distributors, Ltd., 109, South Street, Enfield, Middx.
Bylock Electric, Ltd., 109, South Street, Enfield, Middx.

Cadisch, R., & Sons, Red Lion Square, London, W.C.
Calidec, Ltd., 12-15, Lupin Street, Birmingham, 7.
Campbell Engineering Co., Ltd., Bromley, Kent.
Carefree Domestic Appliances, Ltd., 44-48, Adeline Street, Manchester, 4.
Carron Company, Carron, Falkirk.
Carter Electrical Co., Ltd., Eastern Works, Eastern Avenue, Romford.
Chalfont Electrical Products, Ltd., Tyrrell Street, Leicester.
Chilton Electric Products, Ltd., Hungerford, Berks.
Churn Co., Ltd., Station Road, Hailsham.
Clegg & Coupe, Ltd., Molesworth Street, Rochdale.
Coalport Metalware, Ltd., Coalport, Ironbridge, Shropshire.
Coldette Refrigeration, 11, Dafforne Road, London, S.W.17.
Coldrator, Ltd., Fletton, Peterborough.
Cole, E. K., Ltd., Ekco Works, Southend-on-Sea.
Collaro, Ltd., By-Pass Road, Barking.
Columbus-Dixon, Ltd., Capitol Works, Empire Way, Wembley, Middlesex.
Cona Coffee Machine Co., Feldon Works, Railway Place, Wimbledon, London, S.W.19.
Cone Fittings, Ltd., 9, Rosemont Road, London, N.W.3.
Continental Components, Ltd., 124, Seymour Place, London, W.1.
Controlled Heating Units (London), Ltd., Avenue Road, Hampton, Middlesex.
Co-operative Wholesale Society, National Works, Hall Street, Dudley, Worcs.
Corfield-Sigg, Ltd., Trafalgar Works, Merton Abbey, London, S.W.19.
Cotto Products, Enterprise Works, Scunthorpe.
Coventry Radiator & Presswork Co., Ltd., Canley Works, Coventry.
Cradley Foundry & Engineering Co., New Road, Cradley, Staffs.
Cranmer & Cheshire, Ltd., 7-9, Steward Street, Birmingham, 18.
Creston Electric, Ltd., Pennant Street, Oldham.
Crosslands (Rugeley), Ltd., 55, Ebury Street, London, S.W.1.
Crown Appliances, Ltd., 18, Gipsy Hill, London, S.E.19.
Crypton Equipment, Ltd., Bridgwater.
C.S.A. Industries, Ltd., Wharf Street, Warwick.

Darlaston Galvanised Holloware Co., Ltd., Wednesbury, Staffs.
Davidson, A. D., Electric Co., 62, Granville Street, Birmingham, 1.
Denhams (Norwich), Ltd., St. George's Works, All Saints Road, Acton, London, W.3.
Dependable Products, Ltd., Queensway, Team Valley Trading Estate, Gateshead-on-Tyne.
Derby Alabaster (Art Products) Co., 40, Crosby Street, Derby.
Dernier & Hamlyn, Ltd., 23, Newman Street, London, W.1.
Dexray Engineering Co., Ltd., 34, Ardwick Green South, Manchester, 13.
Dimplex, Ltd., Millbrook, Southampton.
Dishlex Division Scotts Engineering (Newport), Ltd., 56, Moorgate, London, E.C.2.
Dishmaster (London), Ltd., 151, Great Portland Street, London, W.1.
Donaldson Wireless Electric Irons, 31, Sloane Street, Leith, Edinburgh, 6.
Dorset Light Industries, Ltd., 88, East Street, Bridport, Dorset.
Downer, G. V., 29b, Torrington Square, London, W.C.1.
Dowsing Co. (Electrical Manufacturers), Ltd., Kangley Bridge Road, Lower Sydenham, London, S.E.26.
Drake & Gorham Wholesale, Ltd., 77, Long Acre, London, W.C.2.
Dryden, Thos., & Sons, Ltd., Drydenair Dept., Grimshaw Street, Preston.
Dualit, Ltd., 18-22, Penarth Street, Ilderton Road, S.E.15.
Dugdale Mfg. Co., Craven Sheet Metal Works, Settle, Yorks.
Dulci Co., Ltd., 97, Villiers Road, London, N.W.2.
Dulrae, Ltd., Griffin Lane, Aylesbury.

E.C.D., Ltd., Priory Mill, Tonbridge.
E.R. Company, Elliott Works, Elliott Road, Bromley, Kent.
Easco Electrical, Ltd., 6-8, Brighton Terrace, London, S.W.9.
Easiclene Porcelain Enamel (1938), Ltd., Darlaston, South Staffs.
Easipower, Ltd., 213-215, Gloucester Place, London, N.W.1.
Edison Swan Electric Co., Ltd., 10-12, Euston Buildings, London, N.W.1.
Edy (Gt. Britain), Ltd., Farnley Low Mills, Whitehall Road, Leeds, 12.
Ekco-Ensign Electric, Ltd., 45, Essex Street, London, W.C.2.
Electric Art Shade (1928), Ltd., Feering Factory, Kelvedon, Essex.
Electric Bedwarmers, Ltd., Commercial Street, Hebden Bridge, Yorks.
Electric Construction Co., Ltd., Bushbury, Wolverhampton.
Electrix, Ltd., Sterling Works, Dagenham.
Electro-Medical Blankets, Ltd., Nugent Street, Leicester.
Electrolux, Ltd., 153-155, Regent Street, London, W.1.
Electrothermal Engineering, Ltd., 270, Neville Road, London, E.7.
Electroway Heaters, Ltd., Sparrow Hill, Loughborough.
Elga Products, Ltd., Railway Place, London, S.W.19.
Eltron (London), Ltd., Accrington Works, Strathmore Road, Croydon, Surrey.
Endo Industries, Ltd., 97e, Westbourne Terrace, London, W.2.
Engel, S. I., 23-25, Kensington Park Road, London, W.11.
English Electric Co., Ltd., Queens House, Kingsway, London, W.C.2.
Entwisle & Kenyon, Ltd., Accrington.
Euk Catering Machinery, Ltd., Wellington Street, Oldham.
Ever Ready Co. (Great Britain), Ltd., Hercules Place, London, N.7.
Express Vacuum Cleaner Co., 96, Bath Street, Birmingham, 4.

Falco Electrical Appliances, Ltd., Corporation Road, Audenshaw, Manchester.
Falcon Forge (Proprs.: Thomas Haywood & Sons), Coulsdon, Surrey.
Falk, Stadelmann & Co., Ltd., 91, Farringdon Road, London, E.C.1.
Fattelay & Sharp, Ltd., 10a, Acton Street, Gray's Inn Road, London, W.C.1.
Fenton Byrn & Co., Ltd., Airflow Works, 21, Berrylands Road, Surbiton.
Ferranti, Ltd., Hollinwood, Lancs.
Filtrite, Ltd., 91-97, London Road, Manchester, 1.
Finmar, Ltd., 26, Kingsley Street, London, W.1.
Formo Products, Ltd., Masons Hill, Bromley, Kent.
Forrest, George, & Son, Ltd., 38, Osborne Road, London, W.3.
Fransen, John A., Ltd., Northwood Hills, Middlesex.
French, Thos., & Sons, Ltd., Chester Road, Manchester, 15.
Friedland, V. & E., Ltd., Lower Heys Mills, Macclesfield, Cheshire.
Frigidaire, Division of General Motors, Ltd., Stag Lane, Kingsbury, London, N.W.9.
Frost, H., & Co., Ltd., Fieldgate, Walsall, Staffs.

G.B.M. (Electrical), Birmingham, Ltd., 439, Moseley Road, Birmingham, 12.
Gatehill Manufacturing Co., Ltd., Crown Works, Crown Yard, Stanhope Street, London, N.W.1.
General Electric Co., Ltd., Magnet House, Kingsway, London, W.C.2.
Gent & Co., Ltd., Faraday Works, Leicester.
Gillott Electro-Appliances, Ltd., Cotswold Works, Chalford, Near Stroud, Glos.
Glover, J., & Sons, Ltd., 39-49, Groton Road, London, S.W.18.
Grafton Heater Co., Ltd., 13-15, Westland Place, London, N.1.
Griffin, David, Ltd., 39, Wimborne Road, Poole.
Grubb Engineering Co., Ltd., Mary Street, Birmingham, 12.

H.M.V. Household Appliances, Ltd., Hayes, Middlesex.
Hague & McKenzie, Ltd., Pyramid Works, Sloane Street, Birmingham, 1.
Haigh Engineering Co., Ltd., Ross-on-Wye, Herefordshire.
Hall & Veret, Ltd., 434, Rochester Way, Sidcup, Kent.
Hanovia Lamps Division, Englehard Industries, Ltd., Slough, Bucks.
Hawkins, L. G., & Co., Ltd., 30-35, Drury Lane, London, W.C.2.
Haynor, Ltd., 167, Greyhound Road, London, W.6.
Haywood, Thomas, & Sons (Falcon Forge), Coulsdon, Surrey.
Heatovent Electric, Ltd., Lomond Street, Possilpark, Glasgow, N.
Heatrae, Ltd., Heatrae Works, Norwich.
Heayberd, F. C., & Co., Ltd., Greenwich South Street, London, S.E.10.
Hifi, Ltd., Derry Works, Brierley Hill, Staffs.
Hillman Electric Motors, Ltd., 2-3, Northwold Buildings, Northwold Road, London, N.16.
Hobourn Domestic Appliances, Ltd., Temple Farm Works, Strood, Rochester, Kent.
Hollman, Oswald, 208, Kent House Road, Beckenham.
Holt Engg. & Mfg. Co., Ltd., Hemco Works, 210, Stockport Road, Manchester, 13.
Holt, Robert (Middx.), Ltd., Florence Road, Edmonton, N.18.

Homefyre, Ltd., 66-72, Brewery Road, London, N.7.
Homeshade Co., Ltd., 99, Baker Street, London, W.1.
Hoover, Ltd., Perivale, Greenford, Middx.
Hope, David, & Co., Ltd., Nugent Street, Leicester.
Horstmann Gear Co., Ltd., Newbridge Works, Bath.
Horvell Products, Ltd., Redhouse Industrial Estate, Aldridge, Staffs.
Hotpoint Electric Appliance Co., Ltd., Peterborough.
Hounslow, C., & Co., Ltd., Chalex Works, Southwick, Sussex.
Hume, Atkins & Co., Ltd., New Icknield Way, Letchworth.
Hurseal, Ltd., 229, Regent Street, London, W.1.

I.R.L. Products, Ltd., No. 5 Factory, Upper Bristol Road, Bath.
Industrial Humidifiers, Ltd., Groveley Road, Christchurch, Hants.
Infra-Heat Co., Ltd., 22, Clifton Road, London, W.9.
Isopad, Ltd., 3, Rosemont Road, London, N.W.3.

J.P. Engineering Co., Ltd., Meynell Road, Leicester.
Jackson Electric Stove Co., Ltd., Dallow Road, Luton.
Jelson Electric, Ltd., Spring Road, Tyseley, Birmingham, 11.
Jones & Stevens, Ltd., Long Lane, Littlemore, Oxford.

Kaymet Co., 41, Kennington Lane, London, S.E.11.
Kego Electric Co., Ltd., Mount Pleasant, Wembley.
Keith Blackman, Ltd., Mill Mead Road, London, N.17.
Kenwood Manufacturing Co., Ltd., 26, North Audley Street, London, W.1.
Key Leather Co., Ltd., 5, Urswick Road, London, E.9.
Kindler Electric Co., Ltd., The Grays, High Street, Harlington, Middx.
Kirolite Products, Ltd., 107, Southwick Road, Boscombe East, Bournemouth.
Knightshades, Ltd., Theaklen Drive, St. Leonards-on-Sea, Sussex.

L.P. Patents, Ltd., Paladin House, Bassett Avenue, Southampton.
Lamb, Hingley & Co., Ltd., Lye, Stourbridge, Worcs.
Lan-Bar, Ltd., Seymour St., Birmingham, 12.
Lec Refrigeration, Ltd., Shripney Works, Bognor Regis, Sussex.
Light Soldering Developments, Ltd., 106, George Street, Croydon.
Lighters, Ltd., Pioneer House, Inverness Road, Hounslow, Middlesex.
Lightfoot Refrigeration Co., Ltd., Abbeydale Road, North Circular Road, Wembley.
Limit Engineering Group, Ltd., 15-29, Windsor Street, London, N.1.
Lincass Electric, Ltd., Guildford Street, Chertsey, Surrey.
Linealux, Ltd., 142, Liverpool Road, London, N.1.
Linolite, Ltd., 118, Baker Street, London, W.1.
Loblite, Ltd., Third Avenue, Team Valley Trading Estate, Gateshead-on-Tyne.
London Commercial Electrical Stores, Ltd., 20-22, Cursitor Street, Chancery Lane, London, E.C.4.
Longford Electric Co., 6, Grosvenor Street, Manchester, 1.
Lonor, Ltd., 1, New Burlington Street, London, W.1.
Lossos, M. & J., & Co., Ltd., 31, Beethoven Street, London, W.10.
Low, Duncan, Ltd., 299, Bell Street, Glasgow, C.4.
L.P. Patents, Ltd., Paladin House, Bassett Avenue, Southampton.
Lucas Holder, Ltd., 35, Allesley Old Road, Coventry.
Lumsden Lamp Co., Milburn, Almondbank, Perth.

M.E.A.C., Ltd., 1, Chesterfield Street, London, W.1.
McGeoch, Wm., & Co., Ltd., 46, Coventry Road, Birmingham.
McKellen Productions, Ltd., Birmingham Road, Bromsgrove, Worcester.
MacKey Bowley (Steelworkers), Ltd., 21, Caledonian Road, London, N.1.
Maclamp Co., 29, Park Road East, Acton, W.3.
Magnetic Equipment Co., Ltd., Lake Works, Wicor, Portchester.
Main Refrigeration, Ltd., 48, Grosvenor Gardens, London, S.W.1.
Merchant Adventurers, Ltd., 43, Portland Road, London, W.11.
Metal & Electro Chemicals, Ltd., Alliance House, Caxton Street, London, S.W.1.
Metamec, Ltd., South Green, Dereham, Norfolk.
Metropolitan-Vickers Electrical Co., Ltd., Trafford Park, Manchester, 17.
Metway Electrical Industries, Ltd., Metway Works, Canning Street, Brighton, 7.
Midland Electric Mfg. Co., Ltd., M.E.M. Works, Reddings Lane, Birmingham, 11.
Midland Metal Spinning Co., Ltd., Tower Works, Wolverhampton.
Midland Repetition & Auto Mfg. Co., Ltd., Bayton Road, Exhall, Coventry.
Milliwatt, Ltd., 44, Princess Road, London, N.W.1.
Mitchell Electric Co., Ltd., 88-90, Tennant Street, Birmingham, 15.
Modern Electrical Industries, Ltd., Knottingley, Yorks.
Modern Equipment Co., Stockland, Bridgwater, Somerset.
Moffats, Ltd., 1, Newman Street, London, W.1.
Monarch Electric, Ltd., Vicarage Road, Lye, Worcs.
Morley, T. B., & Co., Ltd., Jameson Street, Hull.
Morphy-Richards, Ltd., 6, Conduit Street, London, W.1.

Nash Electrical Co., Ltd., 82, Snow Hill, Birmingham, 4.
Nash-Kelvinator, Ltd., Hudsons Motor Buildings, Great West Road, London, W.4.
New Estate Electrical, Ltd., 16-17, Brunswick Street, Leeds, 2.
New Forest Services, Ltd., High Street, Lyndhurst, Hants.
Nico Light Engineering Co., Ltd., 1, Laud Street, Croydon.
Nobbs (George) (1935), Ltd., 87-89, Cleveland Street, London, W.1.
Nutt Engineering Co., Ltd., Norwich Street, Cambridge.

Ormond Eng. Co., Ltd., Ormond House, Rosebery Avenue, London, E.C.1.
Osborn Manufacturing Co., Ltd., 5-13, Highgate Square, Birmingham, 12.
Osler & Faraday, Ltd., 89-91, Newman Street, London, W.1.
Ozonair Engineering Co., Ltd., The Esplanade, Rochester.

Panelec (Gt. Britain), Ltd., 27, Hatchlands Road, Redhill, Surrey.
Parnall (Yate), Ltd., 255, North Circular Road, London, N.W.10.
Partridge, Wilson & Co., Ltd., Davenset Electrical Works, Evington Valley Road, Leicester.
Parvalux, Ltd., Broom Road, Parkstone, Dorset.
Paul, W. H., Ltd., Longmore Lane, Breaston, Derby.
Payne & Penny, Ltd., 556-558, Kings Road, Chelsea, S.W.
Pearl Industries, Ltd., Birmingham Factory Centre, King's Norton, Birmingham.
Perihel, Ltd., West Mall Works, Rabbit Row, London, W.8.
Permaheat, Ltd., Spectator Street, Manchester, 4.
Philament Electric, Ltd., Trading Estate, Bridgend.
Philips Electrical, Ltd., Century House, Shaftesbury Avenue, London, W.C.2.
Phœnix Sales, Ltd., Winton House, St. Andrew Street, London, E.C.4.
Pifco, Ltd., Pifco House, Watling Street, Manchester, 4.
Poxon, H. G., Engineering Co., 1, Northolt Road, Harrow.
Premier Radio Co., 207, Edgware Road, London, W.2.
Pressed Steel Co., Ltd., Cowley, Oxford.
Price, T., & Son (Stampers), Ltd., Spring Hill Passage, Spring Hill, Birmingham.
Pyrovac, Ltd., 1, Queen's Terrace, Aberdeen.

Quinnell, R. H., & Co., Rowhurst Forge Oxshott Road, Leatherhead.
Quiz Electrics, Ltd., 160, High Street, Teddington.

Rawlplug Co., Ltd., Rawlplug House, Cromwell Road, London, S.W.7.
Ray Engineering Co., Ltd., Waterdale Works, Southmead, Bristol.
Raylor Bros., Ltd., 59, Beavers Lane, Hounslow.
Raysol Electrical Co., 550, Holloway Road, London, N.7.
Reeves Electrical & Radio Co., Ltd., Reelek Works, Baldock.
Remington Rand, Ltd., 26-40, Kensington High Street, London, W.8.
Remploy, Ltd., 25-28, Buckingham Gate, London, S.W.1.
Revo Electric Co., Ltd., Tipton, Staffs.
Ries, B. H., Ltd., 19-21, Hatton Garden, London, E.C.1.
Roberts Electrical Co., Ltd., 11-13, High Street, Byfleet, Surrey.
Robin Hood Electrical Co., Ltd., 646-648, Coventry Road, Small Heath, Birmingham, 10.
Robson Electrical Products, Ltd., Ultralite Works, Union Street, West Bromwich.
Rolls Razors, Ltd., 255, Cricklewood Broadway, London, N.W.2.
Ronson Products, Ltd., 352, Strand, London, W.C.2.
Rowlands Electrical Accessories, Ltd., REAL Works, Hockley Hill, Birmingham, 18.
Runbaken Electrical Products, 45, Oxford Road, Manchester, 1.
Russell Hobbs, Ltd., 1, Bensham Lane, West Croydon.

S.L.R. Electric, Ltd., Welbeck Road, South Harrow.
Santon, Ltd., Somerton Works, Newport, Mon.
Santos Manufacturing Co., Ltd., 5, Chalk Farm Road, London, N.W.1.
Sax, Julius, & Co., Ltd., 24, Commerce Road, Brentford.
Scottish Precision Engineering Co., Ltd., 27, Cadogan Street, Glasgow, C.2.
Selex Electrical Co. (Kirkby), Ltd., Yardley Road, Kirkby Trading Estate, nr. Liverpool.
Senior, John, & Co. (1954), Ltd., Holywell Green, Halifax.
Sew-Tric, Ltd., Honeypot Lane, Stanmore, Middlesex.
Shanks, Alexander, & Son, Ltd., 69, Lots Road, London, S.W.10.
Siemens Bros. & Co., Ltd., 38-39, Upper Thames Street, London, E.C.4.
Simister, Samuel, & Co., Copper and Tin Works, Croston Street, Bolton.
Simplex Electric Co., Ltd., Creda Works, Blythe Bridge, Staffs.
Sims, H., 191, Goldhurst Terrace, London, N.W.6.
Siroma Engineering Co., Ltd., North Acton Road, London, N.W.10.
Skarsten Manufacturing Co., Ltd., 21, Hydeway, Welwyn Garden City, Herts.
Sloan Electrical Co., Ltd., 31-33, Bondway, Vauxhall, London, S.W.8.
Slumberland, Ltd., 11, Conduit Street, London, W.1.
Smith, Herman, Smithlite, Ltd., Empire Works, Dudley.
Smith, W. H. (Eziot), Ltd., 32, Mansfield Street, Churchgate, Leicester.
Smiths Clocks & Watches, Ltd., Sectric House, Waterloo Road, London, N.W.2.
South Wales Switchgear, Ltd., Blackwood, Mon.
Speights, Ltd., Classic Works, Mill Road, Dewsbury.
Sperryn & Co., Ltd., Moorsom Street Works, Birmingham, 6.
Stanley Bros. of Aldershot, Ltd., North Lane, Aldershot.
Steel Radiators, Ltd., Stelrad Works, Southall, Middlesex.
Stevens, Ernest, Ltd., Cradley Heath, Staffs.
Stokes Fountains, Ltd., 185-187, London Road, Croydon.
Straight-Lite Reflectors, Ltd., 36, Eden Grove, Holloway, London, N.7.
Summerscales, W. S., Ltd., Parkside Works, Keighley, Yorks.
Sun Electrical Co., Ltd., 118-124, Charing Cross Road, London, W.C.2.

Sunbeam Electric, Ltd., 6-10, Great Portland Street, London, W.1.
Surgical Equipment Supplies, Ltd., Westfields Road, London, W.3.
Sutcliffe & Clarkson, Whittlefield Mill, Burnley, Lancs.
Syndi Manufacturing Co., Ltd., Industrial Estate, Uxbridge, Middx.

Tack Air Conditioning, Ltd., Longmoore Street, London, S.W.1.
Tarpen Engineering Co., Ltd., Ixworth House, Ixworth Place, London, S.W.3.
Taylor (Albert) (Manchester), Ltd., Isola Works, Quay Street, Manchester, 3.
Teesmade Co., 52, Lansbury Drive, Hayes, Middlesex.
Tellus Super Vacuum Cleaner, Ltd., 39, Sheen Lane, Mortlake, London, S.W.14.
Telsen Electric Co. (1935), Ltd., Fitzgeorge Street, Manchester, 9.
Temperature, Ltd., Burlington Road, Fulham, London, S.W.6.
Thermalux Electrical Products, Ltd., Talbot Works, Lewis Street, Halifax.
Thermat, Ltd., Baldwin House, 132, Arkwright Street, Nottingham.
Thermega, Ltd., 51-53, Victoria Street, London, S.W.1.
Thermolectrics, Ltd., Chapel Works, Church Street, Hampton-on-Thames, Middlesex.
Thermoset Appliances, Ltd., Chapel Works, Failsworth, Manchester.
Thomas, Bertram (Engineers), Ltd., Worsley Street, Hulme, Manchester.
Thomas, Fredk., & Co., Ltd., Everton Buildings, Stanhope Street, London, N.W.1.
Thorn Electrical Industries, Ltd., 105-109, Judd Street, King's Cross, London, W.C.1.
Timex, 161-167, Oxford Street, London, W.1.
Tividale Foundry, Ltd., Local Board Road, High Street, Watford.
Tomlinson, F. J., Ltd., Hall Carr Mill, Rawtenstall, Lancs.
Tricity Cookers, Ltd., 109, Kingsway, London, W.C.2.
Troughton & Young (Lighting), Ltd., 143, Knightsbridge, London, S.W.1.
Truvox, Ltd., 15, Lyon Road, Harrow, Middx.
Tym's Electric, Systym Works, Kennard Road, Stratford, London, E.15.
Tyrad, Ltd., Imperial Court, Basil Street, London, S.W.3.

Unity Heating, Ltd., Chilworth Manor, Southampton, Hants.
Universal Boilers & Engineering Co., Ltd., Fulledge Works, Burnley.

Vactric, Ltd., 196, Sloane Street, London, S.W.1.
Vacuums, Ltd., Aldridge Road, Birmingham, 22b.
Valmade, Ltd., Browells Lane, Feltham.
Vent-Axia, Ltd., 9, Victoria Street, London, S.W.1.
Viceroy Twin Products, Ltd., 2a, Warton Road, Stratford, London, E.15.
Vidor, Ltd., West Street, Erith.
Vulcan Fumigator Co., Ltd., 3, New London Street, London, E.C.3.

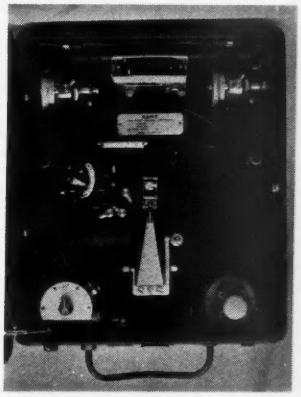
Walter, J. & H., Ltd., Garth Road, Lower Morden, Surrey.
Ward & Goldstone, Ltd., Frederick Road, Pendleton, Manchester, 6.
Wardle Engineering Co., Ltd., Elsinore Road, Old Trafford, Manchester, 16.
Warmalux Mfg. Co., Ltd., Kion End Mills, Bradford, Yorks.
Warmex, Ltd., 375, Milton Road, Cambridge.
Warm-Glow Co., Ltd., Progress Road, Leigh-on-Sea, Essex.
Warner, A. E. (London), Ltd., 56, Brewer Street, London, W.1.
Warnford Constructions, Ltd., 1, Chesterfield Street, London, W.1.
Warranty Electrical Products, Ltd., 18, Hendale Avenue, London, N.W.4.
Water Softener & Vacuum Cleaner Service, Ltd., 248, Romford Road, London, E.7.
Watson & Sons (Electro-Medical), Ltd., East Lane, North Wembley.
Webb, H. C., & Co., Ltd., Tame Road, Birmingham, 6.
Webb's Crystal Glass Co., Ltd., 2-3, Norfolk Street, London, W.C.2.
Westclox, Ltd., Strathleven, Dumbarton, Scotland.
Westerman, F. (Wholesale), Ltd., 94, Dale End, Birmingham, 4.
Westinghouse Brake & Signal Co., Ltd., 82, York Way, London, N.1.
White Bros. & Jacobs, Ltd., 45-46, Chalk Farm Road, London, N.W.1.
Wholesale Fittings Co., Ltd., 46, 50 and 52, Commercial Street, London, E.1.
Wilkins & Mitchell, Ltd., Phœnix Works, The Green, Darlaston.
Williams, R. A. (Birmingham), Ltd., Stero Works, Haslucks Green Road, Shirley, Birmingham.
Windak, Ltd., Woodside, Poynton, Cheshire.
Wolf Electric Tools, Ltd., Pioneer Works, Hanger Lane, London, W.5.
Wraithe Bros., Nuttall Street, Blackburn.
Wright, G. & S., Ltd., Mill Road, Dewsbury, Yorks.
Wye Valley Hand Weavers, Ross-on-Wye.

Yelsen, Ltd., Ruxley Corner, Footscray, Kent.

Pressure Controllers

A NEW family of seven slack-diaphragm-operated pressure controllers is announced by George Kent, Ltd., Luton, Beds. These controllers are all of the non-indicating, non-recording, blind-setting type, and comprise suction or pressure controllers, including a special-purpose furnace-pressure controller; differential-pressure controllers; a special-purpose mill controller; and an air-flow controller or differential-pressure transmitter. The general appearance of all these instruments in the FAF group is similar and all are suitable for wall, panel or post mounting, although normally they are not mounted on a panel but near to the operating point.

The edgewise gauge at the upper centre of the door shows the "supply" and "control" air pressures of the Kent Mark 20 controlling circuit, expressed as percentages between minimum and maximum range. Any one of a number of mechanisms in the Mark 20 series of pneumatic-controlling units can be fitted in the instruments. The FAF instrument case encloses an air-reducing valve, a relay, and an auto/manual switch. Where special testing and servicing facilities are required for the controlling unit, the instrument is associated with the Kent auto/manual/test/service and remote manual station. Where "overshoot" of the desired pressure value, following a period of regulator saturation, is likely to cause difficulty, and where integral action is used in the controlling unit, Kent make available their automatic bleed unit and/or automatic injector unit for insertion in the control circuit, connected up as an integral-pressure desaturator, within the FAF instrument case.



Kent FAF series suction or pressure controller

All the FAF instruments are designed to operate with the diaphragms in the mid-position, corresponding to a 9 lb/sq in output of the 3-15 lb/sq in controlling unit. The desired-value setting of all the controllers is easily adjusted.

Irradiated Plastic Tapes

A RANGE of irradiated polythene tapes with wide potential applications in the electrical and packaging industries is now available for testing from Tube Investments, Ltd., The Adelphi, London, W.C.2. Following exposure to high energy radiation, the polythene is converted from a thermoplastic melting at 113 deg C to a material which acquires rubbery characteristics above this temperature, and has, in fact, no definite melting point. While the tape remains intact, its tensile strength falls at high temperatures but the limiting operational temperature is about 130 deg C compared with 70 deg C for unirradiated tape.

The tape can be elastically deformed at temperatures above 100 deg C and retains the new shape after cooling. Subsequent reheating will cause it to revert to its original shape. This property is utilised in the encapsulating variety of irradiated tape, which may be caused to shrink and self-seal by heating after application to give a thick coherent protective sheath.

Chemically, the tape closely resembles ordinary types of polythene but has somewhat better solvent, acid and oil resistance. Electrically, the power factor may be slightly reduced but the breakdown strength is increased. Mechanical properties are slightly improved and heat sealing is still possible, though the bond is somewhat weaker than with ordinary polythene. To ensure complete stability the tape has an antioxidant incorporated in it. Furthermore, it is not radioactive.

Electricity Distribution Practice

I.E.E. Mersey and North Wales Centre Chairman's Address

THE new chairman of the Mersey and North Wales Centre of the Institution of Electrical Engineers, Mr. P. d'E. Stowell, in his inaugural address on 1st October dealt with certain selected aspects of electricity distribution. One of the important things that must be emphasised, he said, was that public electricity distribution networks had evolved over a long period of time so that many features of past practice would continue to exist for a considerable time to come.

From the beginning, distribution systems had been developed each around a single point of supply, with the inevitable result that many distribution centres became much too large for the selected voltage. Short-circuit levels became excessive at these centres and an enormous quantity of copper cables was used in the immediate vicinity of the centres.

Relegation of 132 kV Grid

The present era, as Mr. Stowell described it, started in 1948 as the result of the 1947 Electricity Act. The integration of distribution was, he said, the main purpose of the Act, but a future chairman of the Centre in an era yet to be realised would perhaps also record among the characteristic features of the era we were now in, the divorce of generation and distribution, the development of the 275 kV supergrid and the relegation of the 132 kV grid to distribution purposes. With the power stations connected directly to the 132 kV network it was inevitable that the 132 kV network was becoming a part of the distribution system. It would do so more and more, aided by the introduction of the 275 kV network. Although the nominal 415 V distribution network was the one that perhaps had the least notice taken of it, in fact any distribution system invariably had a considerably greater mileage of medium and low voltage mains than all the other voltages put together. In the case of the Merseyside and North Wales Electricity Board, the figures were 7,000 miles of 415 V mains out of a total of 12,000 miles of mains and it was in the medium and low voltage networks that about half of their invested expenditure lay. This expenditure consisted not only of the cost of the cables but also of the cost of burying them in the ground and this was at least as costly as the cables themselves, so that it followed that it was seldom economical to lay down small mains in the first place and to add additional copper later as load grew. The load with which a network could deal, however, could be increased very considerably without increasing the size of the mains by increasing the number of feeding points and so increasing the number of paths over which the power could be distributed, and at the same time reducing the distance over which it had to be distributed. That provided the solution which was now generally agreed as the right one.

It was sound practice to aim at a network of medium voltage mains which once provided would not be expected to require any material additions for all time and, of course, it was desirable to use the minimum size of cables which it was judged would serve this purpose. Later, Mr. Stowell said they limited their transformers feeding medium voltage networks to 500 kVA and the network itself was composed mostly of 0·1 sq in cables reasonably uniformly throughout except for spurs, for which smaller sizes were satisfactory, and for the short connections into the substations, where 0·2 sq in cables were occasionally necessary.

Dealing with higher voltage supplies, the author said that these entailed considerable costs (represented by the switchgear and expensive metering equipment needed) which were substantially independent of the size of supply, so that there was a lower limit to the supply for which high voltage was a really economic proposition for the Board. Nor could it be attractive to the consumer as he might have to duplicate his transforming plant to give him satisfactory security, and costs which were independent of the load made this expensive for small loads.

Mr. Stowell said that in his own area every endeavour was made to work to a limit for supplies direct from the 415 V network in the region of a demand of 60 kW or 100 kW of installed load and that above such figures supplies were still given in the true sense of the word at medium voltage not directly from the network but from a transformer which the Board provided on the consumers' premises.

In dealing with rural electrification, he said that one of the problems that had to be settled before embarking on large-scale schemes was in deciding where to start. It might have been possible to select the more remunerative parts here and there and to have developed them piecemeal, but if that were done it would entail moving construction staff at frequent intervals and this would ultimately make the complete electrification of the area more expensive. Thus, a complete survey was made of the whole area in the first place. It was divided into 193 sections, each representing nine to twelve months' work for one gang and the mileage of mains required in each section was then assessed. Sections were then selected for development in the order of a figure of merit represented by the number of premises which could be connected for each mile of mains.

Squirrel-Cage Motors

THE two-year-old B.S. 2083 "Dimensions of Three-Phase Electric Motors" has helped industry by providing for the complete mechanical interchangeability of various makes of squirrel-cage motors. Two important additions in the recently published revised edition further strengthen this Standard's usefulness. The first is the inclusion of maximum overall external dimensions, which, though still allowing for variations between individual manufacturers, will enable the purchaser to calculate the minimum space needed to accommodate any make of motor. The other main change extends the Standard's cover to the dimensions of flange-mounted motors; the requirements for foot-mounted motors remain substantially the same.

The Standard applies to industrial three-phase 50 c/s motors with continuous maximum ratings in the range of 1 to 20 h.p. (at 1,500 r.p.m. synchronous speed) and voltages up to 650 V. With one exception the dimensions specified are similar to those which were given in the 1949 edition of the American N.E.M.A. standard MG1 but for a given frame size the h.p. outputs have been increased; shaft dimensions and tolerances have, therefore, been adjusted to suit British practice. Copies of B.S. 2083: 1956 may be obtained from the British Standards Institution, 2, Park Street, London, W.1, price 3s.

VIEWS on the NEWS

By REFLECTOR

AT a Press conference which preceded the opening by the Queen of the Calder Hall nuclear power station last week Mr. H. G. Davey, general manager of the Northern Area of the Atomic Energy Authority, handled many questions from representatives of the national newspapers with great skill. He had some difficulty in convincing one or two people that electricity generated from nuclear heat was not to be distinguished from the commoner sort produced by burning coal. In the same strain he would not be pinned down to saying that Calder Hall power would be channelled to any particular load once it got into the grid. Under pressure he conceded that nearby Workington would probably be an immediate recipient of Calder Hall power. Indeed the Workington Iron & Steel Co., whose works were visited by the Queen after the opening of Calder Hall, claimed that theirs was " the first steelworks in the world to use electric power generated by atomic energy." Mr. W. Hyde, of J. B. Hyde & Co., Ltd., Wythenshawe, Manchester, has sent me a cutting from a local paper in which a heading announces ". . . the first atoms flow into Britain's homes."

* * *

Mr. Davey also seemed to have some difficulty in explaining why the station's contribution to the national supply would at first be only about 10 MW, although the reason for the difference between that figure and the station's output was quite plain. Hitherto, Windscale (the plutonium factory) and Calder Hall have been taking a large amount of energy from the grid. Now the new station meets these internal requirements and has a balance for export. Thus the national power system benefits fully from the Calder Hall station. Mr. Davey declined to say what proportion of the power was taken by Windscale. He said that there was such a direct relationship between the production of plutonium and the consumption of power that Windscale's output could readily be calculated if its power demand were known—and that was not considered desirable.

* * *

Calder Hall's contribution to the grid was indicated during the opening ceremony by a large centre-pointer dial graduated in kWh—from zero to 20—with a cyclometer counter in the lower half. The time per revolution varied from between 5 and 6 seconds from which it could easily be deduced that the outgoing power from the station was from 10 to 12 MW, as promised by Mr. Davey. Only two of the 23 MW sets in the Calder Hall " A " station were operating. It is expected that the second reactor and its associated turbo-generators will be running by the end of the year. Construction and commissioning of the " B " station (on exactly similar lines) are following six months behind the " A " station.

* * *

According to the *Daily Herald*, at the Calder Hall opening ceremony " Academician Topchiev, representing Russian atomic scientists, was among the first to congratulate Sir Edwin Plowden, chairman of the Atomic Energy Authority." On the other hand the *Daily Sketch* reported: " Thirty minutes before the Queen switched on the world's first atomic power station for industrial use a bulky little man in a dark overcoat stepped forward and told British scientists: ' You are wrong, Russia did it first.' "

* * *

Mr. H. C. Cooper (of Mek-Elek Engineering, Ltd.) calls my attention to a cryptic remark included in an extract from *The Times* of 14th October, 1856, which appeared in a recent issue of that newspaper. The general theme is the effect of the Crimean war in breaking down Russia's isolation and it is said that

> " the simple vicinity which Russia gains by the railway and the electric railway is nothing compared with the effects and fruits of that vicinity."

Ignoring the rather unusual use of the noun " vicinity," one may ask what the reference to the electric railway meant. It seems to imply an international railway. What means of electric propulsion on any scale existed a hundred years ago? Mr. Cooper suggests that this might form the basis of a Russian claim to have been first in the electric traction field, adding to the list of claims which have already been made.

* * *

In its issue of 30th October, 1896, the *Electrical Review* commented scathingly on "a fearfully exaggerated account" of some experiments made by one Thomas Fleming, of Toms River, N.J., who had been described in the *Boston Advertiser* as the first man to possess an electric farm for electric farming. Observing that there was nothing to be got but cheap copy in allowing the imagination to run riot as the writer of the article had done, the *Review* quoted the following statements:—

> " Electric motors were attached to the cables, and electric ploughs imported from Vienna (why Vienna?), each cutting six furrows at a time. Ground wires and overhead wires run in all directions. Rakers, harrows, mowers and reapers are all worked by motors, and horses are dispensed with. Seed is sown, and fertilisers spread in the same way. Weeds are killed by dragging a wire netting, heavily charged, over the field, or between rows of plants. Buildings are, of course, lighted by electricity, and the big greenhouse is kept bright night and day. Electricity is applied to plants in two ways, through the soil by means of wires buried about 2in and by powerful arc lights, which act like strong sunlight, being softened by amber globes. Under this continuous action radishes, lettuce, spinach, etc., are manufactured in half the usual time. Radishes 17in long and 5½in thick have been grown."

Although the internal combustion engine and not the electric motor has displaced the horse for ploughing, electrical soil warming at least has now become accepted practice. I was particularly interested in the reference to weed killing by electricity, a subject touched upon by Professor R. H. Stoughton in a recent lecture at the Seale Hayne Agricultural College.

OVERSEAS ELECTRICAL TRADE

Exports in September the Lowest this Year

THE value of electrical exports in September was the lowest since July last year. The total of £15·5 million is down by nearly £2·5 million as compared with the preceding month and by about £800,000 as compared with September, 1955. Some of the fall as compared with August, is accounted for by the fact that there were fewer working days. Despite the falling-off in the value of exports which has taken place since the high peak of £19·4 million in May this year, the nine months' total of £161·5 million is still £22·2 million up on the corresponding period of last year, although, in view of the railway and dock strikes last year, the two periods are not strictly comparable.

The only class of electrical goods to show an improvement on the month was radio and electronic apparatus which rose by nearly £500,000. Exports of generating plant and motors were valued at £1,931,459, as compared with £2,576,802 in August and £2,533,604 for September, 1955. There was also a fall in the value of converting machinery, transformers, etc., from £2,536,830 in August to £1,810,343 (£2,662,463 in September, 1955). Shipments of telegraph and telephone material fell by nearly £250,000 in the month to £1,406,310 (£1,170,848 in September, 1955) and cables and wires by over £700,000 to £2,335,998 (£2,340,977 in September, 1955).

Australia took the lead in purchases of generating plant with a value of £282,006, India taking second place with

TABLE I.—ELECTRICAL EXPORTS

Class	Sept., 1956	Nine months ended Sept., 1955	Nine months ended Sept., 1956
	£	£	£
Generating sets and generators:			
Diesel-driven, up to 10 kW	99,828	1,026,179	1,272,465
Ditto, 10 to 65 kW	104,631	1,141,474	1,160,421
Ditto, 65 to 200 kW	56,190	1,013,973	1,179,048
Ditto, over 200 kW	100,976	3,825,804	2,625,346
Spark ignition engine driven	13,428	183,900	271,737
Steam turbine driven	293,982	1,131,892	898,834
Hydraulic turbine driven	—	368,804	51,786
Other prime mover driven	64,872	282,355	507,986
Generators, not exceeding 200 kW	87,012	1,163,445	1,075,517
Ditto, over 200 kW	83,623	963,832	693,560
Parts of generators	167,739	3,984,400	4,411,369
Motors, complete, other than railway, tramway and trolley-bus:			
Up to ½ h.p.	163,392	1,802,311	1,700,985
Over ½ but under 1 h.p.	40,936	576,294	500,789
1 h.p. to 250 h.p.	316,700	3,358,265	3,700,326
Over 250 h.p.	32,341	621,650	600,616
Railway, tramway and trolley-bus motors complete and parts of all motors	99,694	1,359,458	1,407,545
Motor starting and controlling gear	206,115	1,746,072	2,098,664
	1,931,459	24,550,108	24,156,994
Converting machinery	5,753	346,466	286,146
Mercury-arc rectifiers	40,844	634,397	601,973
Transformers for lighting, heating and power (incl. coils)	718,940	8,145,060	9,297,518
Switchgear and switchboards (not telegraph or telephone), up to 200 A and 660 V	225,055	2,396,407	2,452,535
Ditto, other	819,751	9,053,259	10,231,511
	1,810,343	20,575,589	22,869,683
Primary batteries:			
Lighting	77,732	638,346	738,305
Radio	209,651	1,548,508	2,211,817
Other	35,416	334,691	387,249
Parts (excl. carbons)	35,291	289,279	341,641
Lamps:			
Filament, exceeding 24 V	72,536	793,711	883,011
Ditto, under 24 V	26,446	273,515	274,466
Arc lamps and searchlights	17,196	114,325	183,575
Discharge lamps, fluorescent tubes, etc.	60,195	602,707	636,614
Radio and television, etc., apparatus:			
Thyratrons, hot cathode mercury vapour and gas-filled rectifiers (excl. mercury arc rectifiers), photo-electric cells, stabilising and cold cathode valves, magnetrons, klystrons	18,119	171,330	236,919
Cathode-ray tubes	70,891	94,220	321,010
Other valves (not X-ray)	194,025	1,587,493	1,933,044
Parts (excluding glass bulbs)	7,841	214,811	92,893
Radio and television transmitters	145,178	496,228	904,555
Commercial radio and radar equipment	1,512,635	9,064,362	11,019,914
Domestic radio receivers, mains	120,260	1,402,450	1,163,229
Ditto, battery	51,892	581,591	678,366
Ditto, other (incl. car)	23,179	166,690	220,016
Radiograms	36,759	390,934	320,799
Television sets	60,353	186,830	371,790
Public address equipment	71,478	721,196	763,137
Sound reproducing app., n.e.s.	27,902	235,995	294,993
Components and parts, n.e.s.	633,574	5,246,361	6,113,901
	2,974,086	20,560,491	24,434,566
Telegraph and telephone installations	507,750	5,719,536	5,460,651
Telephone instruments, separately consigned	120,168	844,358	1,241,524
Telegraph and telephone parts	558,533	4,230,797	5,647,252
Line apparatus for long distance commun.	219,859	672,712	1,888,548
	1,406,310	11,467,403	14,237,975

Class	Sept., 1956	Nine months ended Sept., 1955	Nine months ended Sept., 1956
	£	£	£
Cookers	50,407	1,028,674	688,454
Toasters	40,437	280,823	229,283
Other cooking apparatus	34,106	272,174	322,672
Parts and accessories	73,380	626,255	707,624
Space heating appliances	20,663	316,875	308,669
Water heating appliances	23,413	284,285	297,058
Other heating appliances	23,363	247,964	332,753
Parts and accessories	63,443	625,954	573,155
Irons	71,148	887,893	826,084
Arc welding equipment, a.c.	32,031	291,163	475,659
Ditto, d.c.	18,255	256,461	406,757
Resistance welding equipment	7,714	173,443	161,119
Electric furnace plant	40,468	475,789	535,936
Magnetos, ignition	22,939	135,777	239,153
Sparking plugs	144,244	1,369,409	1,500,750
Elec. appliances for aeroplanes, n.e.s.	190,429	1,687,193	1,902,209
Ditto, for motor vehicles, n.e.s.	311,216	2,713,126	3,185,665
Ditto, for cycles, n.e.s.	34,105	660,069	550,531
Signalling app. (incl. traffic signals)	53,480	440,551	578,708
Industrial radio-frequency equipment	11,145	130,961	105,894
Bell app. (not telegraphic or telephonic)	6,882	77,606	78,015
Instruments, commercial	155,674	1,278,841	1,544,784
House service meters (including parts)	166,072	1,084,409	1,525,782
Electro-medical apparatus (not X-ray)	103,600	425,877	595,496
X-ray apparatus (excl. tubes and valves)	65,799	556,765	600,478
Vacuum tubes	20,671	188,017	258,654
Ceiling fans, complete	101,826	741,207	968,283
Desk fans, complete and parts of desk and ceiling fans	42,965	271,084	340,014
Vacuum cleaners	142,517	1,197,177	1,275,816
Floor polishers	67,893	845,867	674,524
Food mixers	42,086	448,198	546,581
Hair clippers and dry shavers	127,223	735,136	656,653
Other portable appliances	31,192	389,970	272,443
Parts	82,700	734,518	1,000,745
Portable elec. tools (not saws) and parts	205,132	1,619,077	1,898,810
Cables and wires:			
Telegraph and telephone, submarine	130,390	632,360	1,586,587
Ditto, other	632,012	4,577,872	7,553,811
Cotton, silk or art. silk insulated	25,870	423,322	464,616
Enamel, glass or asbestos insulated	91,235	658,962	898,290
Paper insulated	685,465	6,561,719	8,264,892
Rubber insulated	478,095	4,127,883	4,742,653
Thermoplastic insulated	142,123	740,156	1,251,264
Other	150,808	1,737,892	1,976,830
	2,335,998	19,460,166	26,738,943
Accumulators for motor vehicles	80,768	1,363,294	1,440,062
Ditto, traction	26,963	156,611	241,673
Ditto, radio and other portable	44,877	504,044	751,919
Ditto, other	136,730	295,221	613,353
Parts and accessories	96,317	846,898	817,926
Elec. porcelain, etc. (incl. insulators)	104,712	821,429	1,023,044
Insulating cloth and tape	60,484	543,062	563,615
Other insulating material	81,476	835,626	906,477
Permanent magnets	36,079	420,169	393,913
Radio, telegraph and telephone testing equipment, n.e.s.	44,566	360,543	392,247
Scientific elec. instruments (not telegraphic or telephonic):			
Time recorders and time switches, complete	16,118	235,464	132,604
Other	232,954	1,907,111	1,926,123
Electrical machinery, n.e.s.	77,944	968,675	1,058,404
Electrical apparatus and appliances, n.e.s.	809,673	5,380,356	6,956,730
TOTAL	15,470,938	139,345,940	161,478,140

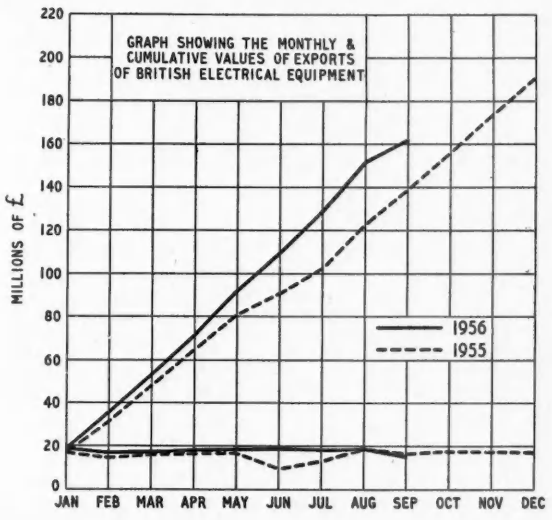
TABLE II.—DISTRIBUTION OF EXPORTS OF ELECTRICAL MACHINERY, APPARATUS AND APPLIANCES

Country	Sept., 1956	Nine months ended Sept., 1955	Nine months ended Sept., 1956	Country	Sept., 1956	Nine months ended Sept., 1955	Nine months ended Sept., 1956
	£	£	£		£	£	£
Channel Islands	66,392	515,394	644,214	Western Germany	111,615	1,463,999	1,494,050
Gibraltar	90,278	148,782	368,258	Netherlands	713,660	5,058,188	5,653,262
Malta and Gozo	38,337	409,137	507,656	Belgium	308,776	2,119,744	2,515,552
Cyprus	111,080	845,417	1,190,069	France	549,633	2,370,351	3,034,053
Sierra Leone	24,608	189,643	230,081	Switzerland	104,583	787,694	880,932
Gold Coast	113,747	1,266,968	1,247,546	Portugal	98,575	1,797,895	1,430,717
Nigeria	212,169	2,291,423	2,544,360	Spain	399,481	1,224,831	3,359,820
Union of South Africa	1,076,981	13,161,618	11,686,727	Italy	276,207	2,066,030	2,472,734
Rhodesia and Nyasaland	351,011	3,867,171	4,502,468	Austria	37,852	455,597	333,097
Tanganyika	49,633	685,991	492,561	Yugoslavia	27,667	542,793	425,266
Kenya	290,731	1,508,694	2,121,336	Greece	173,729	816,342	2,046,237
Uganda	64,759	879,025	648,348	Turkey	74,543	830,184	648,550
Anglo-Egyptian Sudan	49,681	732,011	677,254	Belgian Congo	16,314	228,555	240,010
Mauritius	7,084	247,090	196,128	French Morocco	42,401	274,610	369,080
Aden	23,957	380,526	411,330	Portuguese East Africa	17,255	150,928	189,717
Bahrain, Qatar and Trucial States	85,453	659,619	784,681	Egypt	16,574	1,278,324	1,581,772
Kuwait	134,535	750,611	1,182,878	Libya	42,941	158,306	235,938
India	1,753,333	11,621,253	16,070,954	Syria	49,673	245,314	591,416
Pakistan	242,662	2,929,472	2,685,685	Lebanon	24,238	285,683	471,521
Singapore	326,373	2,827,056	2,727,464	Israel	39,823	312,640	799,509
Federation of Malaya	278,492	2,144,701	2,392,318	Jordan	41,469	303,311	494,221
Ceylon	202,833	1,041,538	1,689,938	Saudi Arabia	123,171	688,222	1,109,680
British North Borneo	19,742	180,071	215,991	Iraq	96,866	1,711,238	2,713,895
Sarawak	8,210	152,652	139,752	Iran	58,504	540,001	1,638,053
Hong Kong	240,297	1,334,229	1,896,652	Burma	48,832	1,413,736	1,033,823
Australia	1,477,137	15,690,366	16,605,142	Thailand	43,233	1,186,262	782,170
New Zealand	694,054	8,982,971	7,834,404	Indonesia	32,874	251,751	467,222
Fiji	23,096	162,517	188,534	Japan	76,796	840,553	592,626
Canada	907,092	6,011,992	9,562,198	United States	458,115	3,773,601	6,993,130
Jamaica	88,814	751,914	897,541	Cuba	26,627	215,731	329,173
Barbados	12,727	153,562	216,568	Mexico	123,041	348,379	674,773
Trinidad	80,823	790,863	919,802	Colombia	68,055	716,121	691,981
British Guiana	28,121	403,310	341,784	Venezuela	194,093	1,837,724	2,395,320
Other Commonwealth countries	92,669	1,009,031	804,268	Peru	32,972	378,973	449,241
Irish Republic	225,628	2,897,364	2,570,330	Chile	35,609	228,736	1,249,889
Soviet Union	147,783	2,280,735	2,033,894	Brazil	59,379	526,135	1,461,756
Finland	118,717	1,195,517	1,326,507	Uruguay	5,056	311,903	87,057
Sweden	350,782	2,925,150	3,047,037	Argentine Republic	60,554	1,338,525	703,817
Norway	215,751	2,636,437	1,925,539	Other foreign countries	173,727	2,038,531	2,308,036
Iceland	16,020	114,013	126,049				
Denmark	183,531	1,269,335	1,613,778	TOTAL	15,470,938	139,345,940	161,478,140
Poland	61,986	183,330	261,020				

imports of £264,389. The principal buyer of converting machinery, transformers, etc., was India which took equipment valued at £346,999; South Africa held second place with imports of £254,818. In the radio apparatus section France purchased equipment valued at £391,435, the principal Commonwealth buyers being Canada (£247,653) and India (£208,039). Australia was the largest buyer of telegraph and telephone material with a value of £213,416.

Electrical equipment and apparatus additional to that shown in Table I, given in the Board of Trade returns, include the following:—

Electrically operated washing machines, complete, not exceeding 150 lb net weight: September, £202,198; nine months, £2,583,129. Ditto, 150-250 lb net weight: September, £111,125; nine months, £914,468. Parts: September, £53,612; nine months, £608,316.



Electric lighting fittings and lanterns, complete, with or without bulbs (excluding arc lamps, searchlights and cycle lamps): September, £130,754; nine months, £1,284,091. All other electric lighting appliances: September, £273,001; nine months, £2,890,628.

Electric carbons, including parts: September, £40,192; nine months, £430,778.

Welding electrodes (excluding carbon), covered: September, £90,655; nine months, £991,519.

Electric conduit tubes and cased tubes: September, £72,414; nine months, £635,013.

Electric locomotives: September, £345,822; nine months, £1,918,151. I.c. engine locomotives with electrical transmission: September, £317,845; nine months, £6,816,783.

In Table II we show the distribution of electrical machinery and apparatus given in Table I.

Electrical equipment imports, which have been falling during the past few months, rose in September by nearly £400,000, as compared with August, to £2,023,992, and the nine months' total was £17,408,153 (against £17,371,998 for January-September, 1955). The principal supplying countries were the United States with a value of £739,838, and Western Germany which supplied goods valued at £392,157. Radio and electronic apparatus (£836,958) continued as the principal class of imports.

Monopolies Commission

THE Board of Trade is reconstituting the Monopolies and Restrictive Practices Commission on 31st October in accordance with the Restrictive Trade Practices Act, 1956. The Commission will then be known as the Monopolies Commission. At his own request Sir David Cairns, Q.C., will give up his appointment as chairman at the end of October and will be returning to the Bar. Mr. R. F. Levy, Q.C., will be appointed chairman of the reconstituted Commission on 1st November. The names of the other members will be announced shortly.

PERSONAL AND SOCIAL

News of Men and Women of the Industry

Mr. W. J. A. Sykes, whose appointment as chief mechanical and electrical engineer of the Southern Region, British Railways, we recently reported, was educated at Westminster School and King's College, London. After serving apprenticeships with J. Stone & Co., Ltd., Deptford, the Westinghouse Brake & Signal Co., Ltd., and the London Underground Railways, he entered the service of the former Southern Railway in 1930 as draughtsman in the Electrical Engineer's (New Works) Department, which was then engaged on the electrification of the London-Brighton main line. In 1935 he became technical assistant to the rolling stock engineer and was engaged in the design and testing of electrical rolling stock for the widespread extensions of Southern Railway electrification carried out between 1935 and 1939. On the outbreak of war he became assistant to the London central divisional rolling stock engineer at Redhill, but was recalled to head office in 1941 in connection with design work on electric locomotives. In 1943 he was appointed rolling stock assistant to the chief electrical engineer, and in 1948 became assistant electrical engineer, Southern Region, with responsibilities covering both power supply (generation and distribution) and electric rolling stock in the electrified areas.

Mr. W. J. A. Sykes

Mr. G. O. Richardson, B.Sc., A.M.I.E.E., has joined Ranald J. Harvey & Partners, consulting engineers, as chief engineer—power production. Mr. Richardson, after reading for his degree at the University of Durham, had experience with various firms and on release from the Forces he was with the Balfour Beatty Construction Department, Nairobi. Since 1951 he has been with E. B. Badger & Sons, oil refinery and chemical plant designers, as senior electrical engineer. After transfer from the R.A. (T.A.) in 1939 Mr. Richardson served in the Royal Engineers until 1948, and at present commands III Plant Regiment, R.E., A.E.R.

Mr. R. Yates has retired after sixty years' service with George Forrest & Son, Ltd., during which he has worked on lighting fittings for many famous buildings including Osborne House, St. James's Palace and Buckingham Palace. At a farewell ceremony, over which Mr. G. Gibson, a director of the company, presided, Mr. Yates was presented with a cheque by Mr. A. S. Shier, sales director, on behalf of Thorn Electrical Industries, Ltd., the parent company, and Mr. L. W. A. Davis, chief draughtsman, presented him with a Westminster chime clock on behalf of the staff.

Mr. A. H. Edney, D.A.A., M.I.A.M.A., group advertising manager of Parnall (Yate), Ltd., has been installed, for a period of two years, as chairman of the Society of Diploma Members of the Advertising Association.

Speaking at the annual dinner of the West of England Section of the **Electrical Power Engineers' Association** at the Grand Hotel, Bristol, on 19th October, Mr. A. N. Irens, chairman of the South Western Electricity Board, referred to the opening of Calder Hall as the big event of our lifetime. It was the dawn of a new era, the salvation of our country. They, as electrical engineers, would have to bear the brunt of this new development. The responsibility of electrical engineers would be greatly increased in the future, but they were competent to meet the demands that would be made of them.

Mr. J. E. Stanton, president, in replying to Mr. Irens' toast to the Association, said that the prosperity of every country in the world was measured by its electrical industry. The Electrical Power Engineers' Association had made its contribution to raising the status of this country. It was expected that in ten years electricity consumption in this country would rise by 100 per cent and the electrical power engineers would have to decide how that 100 per cent could be provided and maintained.

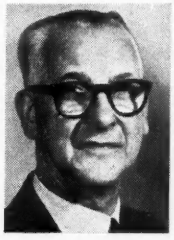
Mr. R. Appleby has been appointed managing director of Black & Decker, Ltd., in succession to the late Mr. J. V. Franklin. Mr. Appleby joined Black & Decker, Ltd., in 1953 as a director and later that same year was appointed director and general manager. He will retain his present position as director of international operations of the parent company, the Black & Decker Mfg. Co., Towson, Maryland, U.S.A., in which capacity he is responsible for all the parent company's activities outside the United States and Canada.

Mr. R. Appleby

Mr. J. Allen, chief inspector of switchgear with George Ellison, Ltd., is retiring on 31st October after serving the company for forty-three years. His successor will be **Mr. F. Mullis.**

Mr. Allen was educated at Aston Technical College, Birmingham, and commenced his career with Veritys, Ltd., in 1904. Later he joined Electric & Ordnance Accessories, Ltd., as testing experimental engineer, and commenced his association with George Ellison, Ltd., in 1912. In addition to his work as chief inspector, Mr. Allen has served the Ellison A.S.T.A. testing station in an advisory capacity, and he played a large part in the laying down of its forerunner, the first Ellison short circuit testing plant.

Mr. Mullis is also a former student of Aston Technical College. He has been with the company for ten years and was an official A.S.T.A. observer in the Ellison testing station before being appointed deputy to Mr. Allen.



Mr. J. Allen

Mr. F. Mullis

Mr. H. J. Harrison (buyer and representative) and **Mr. W. R. Kemp** (transport manager) of the head office of J. Millet (Electrical), Ltd., have completed thirty years' service with the company and have received cheques in recognition of their services.

The directors of **Parkinson Cowan, Ltd.,** whose subsidiaries include Measurement, Ltd., and Parkinson & Cowan Instruments, gave a dinner at the Trocadero Restaurant, London, on 2nd October to the group sales staff.

Mr. W. A. Hartop, works director of George Kent, Ltd., leaves by air to-day (Friday) on a month's visit to Canada.

Six more engineers have completed fifty years' service with **G. & J. Weir, Ltd.,** and on 15th October they received presentations from the directors by Mr. J. K. Weir, chairman. The men were Messrs. J. MacLellan (Nitshill), J. Maxwell (Cathcart), W.

Donaldson (Pollokshaws), W. Lindsay (Netherlee), W. A. Thomas (Cathcart) and E. G. Lyle (King's Park).

At this year's sales conference Mr. H. C. Timewell, manager of the Domestic Appliance and Television Division of the English Electric Co., Ltd., announced that the Division was to have its own market research unit with effect from 1st November next. Heading the unit will be **Mr. K. G. Miller,** who is to transfer from the commercial manager's office at Liverpool to be manager of the new division. Since graduating in commerce from the University of Liverpool in 1951, Mr. Miller has been with the English Electric Co., at Liverpool, where he started as a trainee. After training with various of the company's sales departments, he was put in charge of the statistical and economic work of the commercial manager's office, and has remained there for the last three and a half years until his present appointment.

Mr. K. G. Miller

The annual dinner of **The Lightmongers** will be held at the Old Red House (Pimm's Restaurant), Bishopsgate, London, E.C., on 6th November (6.30 p.m. for 7.15 p.m.), and will be preceded by the annual general meeting at 6 p.m.

Bylock Electric, Ltd., has appointed **Mr. E. Farnes** as home sales manager and **Mr. D. H. Mason** as distribution controller.

The Mickelwright Co., Ltd., Wembley, informs us that **Mr. H. H. Johnson** has been appointed manager as from 1st October, following the resignation of Mr. B. T. S. Gamble.

Mr. H. H. Johnson

The Grand Council of the Federation of British Industries has elected **Sir Hugh Beaver,** K.B.E., as deputy president.

Johnson & Phillips, Ltd., announce the appointment of **Mr. P. T. Davies,** B.Sc., A.M.I.E.E., as manager of their Switchgear Department. Mr. Davies, who received his training at the English Electric Co.'s Stafford Works, subsequently spent twenty-three years with that company in various capacities in its switchgear organisation and also as its technical representative with the Westinghouse Corporation in America. He left the English Electric Co. to join the Brush Electrical Engineering Co., Ltd., as general manager of its factory in Cardiff in 1950, and has for the last two years been with the South Wales Switchgear Co. Mr. Davies will take up his duties with Johnson & Phillips on 5th November.

Mr. Iain S. Malcolm, T.D., B.Sc., has been appointed education and training officer to Hoover (Washing Machines), Ltd., Merthyr.

The **Portland Players** (the dramatic society of the Central Electricity Authority Headquarters Sports and Social Club) is presenting "The Holly and the Ivy" at the Portland Hall, Little Tichfield Street, London, W.1, on 8th and 9th November.

The annual dinner-dance of the **I.E.E. Scottish Centre** will be held on 20th November at Grosvenor Restaurant, Gordon Street, Glasgow. Tickets (32s 6d for members and 15s for graduates and students) can be obtained from Mr. J. H. P. de Villiers, hon. secretary, 19, Waterloo Street, Glasgow, C.2. Applications should be made by 12th November.

On Friday last, 19th October, the **Birmingham Electric Club** held its 40th annual dinner at the Grand Hotel, Birmingham. A toast to the Club was proposed by Alderman A. L. Gibson, J.P., Deputy Mayor of Birmingham, who made a brief speech referring to the great progress which had been made in the electrical industry during the 50 years which the Club had been in existence.

The response was made by Mr. D. E. Reynolds, president of the Club, who said that during the last 15 years there had been a decline in the quality of products, workmanship and also speed of working. Until recently few boys elected to enter work enabling them to become skilled craftsmen. Without these craftsmen the outlook was gloomy. It was the individual who set the standard, so it was up to them all individually to do everything in their power to rectify this deplorable situation. A toast to the guests was proposed by Mr. J. Clement, a brief and humorous response being made by Mr. Stephen F. Burman.

OBITUARY

Mr. James Robinson, M.B.E., D.Sc., Ph.D., M.I.E.E., F.Inst.P., technical adviser to the British Radiostat Corporation, died on 21st October at the age of seventy-two. Dr. Robinson was a lecturer in physics at a number of universities between 1909 and 1914, and during the 1914-18 war served in the R.N.V.R. and the R.N.A.S. From 1918 to 1925 he was in charge of research and development work in radio and photography for the R.A.F., and he was a pioneer of the radio compass on aeroplanes; he also introduced the stenode system and the quartz crystal gate (methods of obtaining high selectivity in radio reception). Dr. Robinson was a past vice-president of the British Institution of Radio Engineers and was a member of the Parliamentary and Scientific Committee. He was the author of many papers on physics, particularly on photo-electricity, acoustics, and applications to radio.

Mr. George Norman Fox, non-ferrous development manager of the Spencer Wire Co., Ltd., died on 18th October at the age of sixty. Mr. Fox had been with the company for two and a half years, and was previously for many years a director and general manager of the Concordia Electric Wire & Cable Co., Ltd.

Mr. John H. Sutcliffe, Associate I.E.E., M.Inst.F., chief engineer of John Bright & Brothers, Ltd., Fieldhouse Mills, Rochdale, Lancs., collapsed and died in his office on 15th October at the age of fifty-six. He joined the company ten years ago.

Mr. Thomas Wadsworth, M.Sc., M.I.E.E., who, until he retired at the end of 1947, was for many years chief assistant to the head of the B.T.H. Research Laboratory at Rugby, died on 12th October on board ship bound for South Africa. Mr. Wadsworth was born in 1880. After graduating at Manchester University he joined the General Electric Co., Ltd., at Salford, and later became lecturer at Chelsea Polytechnic and subsequently head of the Engineering Department at Woolwich Polytechnic. During the 1914-18 war he served in the Royal Engineers, and on being demobilised was appointed head of the Electrical Engineering Department at Coventry Technical College. When, in 1924, the late Mr. R. C. Clinker was appointed head of the newly formed B.T.H. Research Laboratory, he invited Mr. Wadsworth to join him and to take charge of the electrical section which was to be responsible for valve and valve circuit developments. Later, when Dr. Warren (now Sir Hugh Warren) succeeded Mr. Clinker, Mr. Wadsworth became his chief assistant. He was chairman of the Radio Section of the Institution of Electrical Engineers in 1937 and in 1933-34 was president of the Rugby Engineering Society.

The late Mr. T. Wadsworth

Mr. H. W. Young.—The death occurred on 10th October, at the age of seventy-two, of Mr. Henry Williamson Young, managing director of Industrial Electric (Shrewsbury), Ltd. Mr. Young was born in Dundee and received his technical education in marine and general engineering at the Glasgow and West of Scotland Technical College. He joined the firm of Alley & McLellan, Polmadie, Glasgow, in 1906, as plant draughtsman,

later going to Shrewsbury as chief engineer at the Sentinel Wagon Works where he was responsible for many improvements in the design of the Sentinel steam wagon. In 1920 he commenced business on his own as an electrical and mechanical engineer and in recent years the business was made into a limited company under the name of Industrial Electric (Shrewsbury), Ltd., of which his widow and two sons are directors.

WILLS

Mr. C. G. Carrothers, B.Eng., M.I.E.E., A.M.I.M.E., head of the Research Department of Kennedy and Donkin, who died on 22nd May last, left £8,162 gross (£8,091 net).

Dr. S. Whitehead, M.A., D.Sc., M.I.E.E., F.Inst.P., director of the Electrical and Allied Industries Research Association, who died on 5th May last, left £8,088 gross (£7,730 net).

Mr. E. A. Richards, M.B.E., B.Sc., A.C.G.I., M.I.E.E., formerly chief rectifier engineer, Standard Telephones and Cables, Ltd., who died on 20th June last, left £4,669 gross (£4,593 net).

Mr. H. L. J. Bullen, for over twenty years manager of the Lewisham branch of the Wholesale Electric Co., Ltd., who died on 10th May last, left £9,747 gross (£8,903 net).

Sir Robert Geoffrey Ellis, Bt., formerly chairman of the Yorkshire Electric Power Co., who died on 28th July, left £258,515 gross (£256,383 net).

Mr. C. G. Mancha-Bennett, M.I.E.E., of 7, Heath Rise, S.W.15, formerly chief control engineer to the London Power Co., who died on 5th July, left £12,759 gross (£12,273 net).

Mr. K. R. Evans, O.B.E., M.A., M.I.E.E., A.M.I.Mech.E., manager of the Education Department of the Metropolitan-Vickers Electrical Co., Ltd., who died on 22nd March, left £4,568 gross (£2,967 net).

Mr. W. G. Ramsden, chief electrical engineer at British Ropes, Ltd., who died on 15th February, intestate, left £5,326 gross (£4,993 net).

Mr. J. Sinnott, O.B.E., M.I.E.E., formerly assistant engineer-in-chief of the G.P.O., London, who died on 21st June last, left £5,404 gross (£5,252 net).

Mr. V. Young, a director of International Combustion (Holdings), Ltd., who died on 18th April, left £60,817 gross (£56,186 net).

The Late Mr. P. V. Hunter

IT is with regret that we have to record the death, which occurred on 22nd October, of Mr. Philip Vassar Hunter, C.B.E., Hon.M.I.E.E., who for so many years held a leading position in the electrical industry and particularly in connection with cable manufacture.

The late Mr. P. V. Hunter

Mr. Hunter was born at Walsoken, Norfolk, in 1883 and was educated at Wisbech Grammar School and Faraday House. His practical training was received with Willans & Robinson and with Robert Hammond. In 1904 he joined Messrs. Merz & McLellan, becoming a partner and head of their electrical department. During the 1914-18 war he was "lent" to the Admiralty for anti-submarine work, when he was associated with the development of the "Asdic" system. His long association with the electric cable manufacturing industry commenced in 1919 when he was appointed chief engineer to Callender's Cable & Construction Co., Ltd.; he became a director in 1937 and subsequently engineer-in-chief and deputy chairman of the companies merged under the title of British Insulated Callender's Cables, Ltd. He retired from the position of deputy chairman in 1952 but continued to serve as a non-executive director, and remained on the boards of several of the subsidiary companies.

Among his many inventions were the "split conductor" and "four conductor" methods of automatic cable protection. His invention early in the last war of the buoyant cable contributed largely to the defeat of the magnetic mine.

Mr. Hunter had for many years been active in securing sound installation work. From 1925 he had been chairman of the National Register of Electrical Installation Contractors and he became chairman of the National Inspection Board which was recently set up for the registration of electrical contractors and the inspection of installations. He outlined the origin and constitution of the organisation in an article in the *Electrical Review* of 29th June last. He was a past-president of the Institution of Electrical Engineers (1933) and for his outstanding services to the electrical industry and to the Institution he was elected an honorary member in 1951. He was a Fellow of the American Institute of Electrical Engineers. For many years he was active in a number of other electrical directions among which may be mentioned the E.I.B.A., of which he was president from 1939 to 1941, the International Electro-Technical Commission, C.I.G.R.E., the British Standards Institution and the Electrical Research Association; he was president of the British Electrical Power Convention in 1952.

In addition to his association with British Insulated Callender's Cables, Mr. Hunter was on the boards of numerous other companies, including British Dielectric Research, Ltd., British Telecommunications Research, Ltd., Thomas Bolton & Sons, Ltd., the Metropolitan Electric Cable & Construction Co., Ltd., the Telegraph Condenser Co., Ltd., and the United Insulator Co., Ltd., on all of which he served as chairman.

Hot Water for the Dairy

Entitled "Hot Water and Steam in the Dairy," No. 4 in the British Electrical Development Association's series of farm electrification handbooks leaves the reader in no doubt that electrical methods provide the most efficient and hygienic means of meeting all requirements. This 100-page illustrated booklet, which covers the needs of small, medium and large dairy farms, contains nine chapters dealing with the cleansing process, electric water heaters, choice of water heater, installation and maintenance, general principles of steam raising, steam raising equipment, selection of steam raising equipment, electricity consumption for steam raising, and the installation and maintenance of steam raising equipment.

Attention is drawn to both the advantages and possible disadvantages of various methods and equipment, while the tabular data and the accompanying notes provide a ready means of deciding what electrical equipment will be required for any particular service. Two appendices give summaries of the milk and dairies regulations and some useful technical data of interest to the dairy farmer.

Copies of the booklet (E.D.A. 1791) can be obtained from the Electricity Boards or from the British Electrical Development Association, 2, Savoy Hill, London, W.C.2.

B.I.C.C. Railway Contracts

The British Transport Commission, as part of its railway modernisation plan, has placed orders with British Insulated Callender's Cables, Ltd., and British Insulated Callender's Construction Co., Ltd., for overhead conductor work. One is for the Manchester-Crewe main line (London Midland Region), including the main lines at Crewe station, to the extent of 220 track miles. The other covers the 50 track miles between Colchester, Clacton and Walton (Eastern Region). The work is on the 25 kV single-phase 50 c/s system.

Electric Fire Guards

Details of the steps taken by the South Eastern Electricity Board to draw the attention of consumers to the danger of unguarded electric fires were recently given to the Croydon and West Kent District Committee of the Electricity Consultative Council. It was stated that a special poster was being displayed at all the Board's showrooms, and when a fire without suitable guards was returned to a consumer after repair a label was attached suggesting that, in the consumer's interests, a guard should be fitted. The Council has expressed appreciation of the action taken by the Board to prevent accidents.

INDUSTRIAL NEWS

American Split Level House

An American split level house, built in Leicester to designs of the American architect Herman York, has been open to the public during the past fortnight. Of special interest is the all-electric labour-saving kichen, showing that careful planning allows a full range of appliances to be accommodated in a small kitchen of 11ft 6in by 9ft 3in.

Appliances included are a washing machine, 8·3 cu ft refrigerator, raised oven cooker, tumbler dryer, food mixer and plate warmer, all made by the English Electric Co., Ltd. A "Waste-master" garbage disposal unit is fitted under the sink, and there is an "Xpelair" extractor fan. Designed for easy cleaning, all counter tops and the wall surfaces behind them are finished in blue "Formica." White tiles are used behind the appliances and the flooring is in Tudor red rubber. The kitchen has a serving hatch and through-cupboard to the dinette end of the living room.

The house has been built by Mr. F. Stimpson on the Manor Road site, Oadby. Costing approximately £4,600, it is a three bedroomed house, with living room and kitchen leading directly from the hall, recreation room at ground level and boiler and storage room. Central heating throughout the house is by Crane type R thermostatically controlled skirting panels.

The all-electric kitchen of the American split level house in Leicester

Southend Gardens Week

The Eastern Electricity Board recently staged an exhibition of gardening appliances operated by electricity in its service centre in London Road, Southend-on-Sea. The display was later moved to St. Clement's Church Hall, where Mr. Roy Hay spoke on the use which he makes of electricity in his own garden. A large audience saw the film which the Electrical Development Association made of Mr. Hay's Surrey garden, and also joined in a gardens "brains trust" in which the experts were Mr. Roy Hay, Mr. W. A. Cameron Brown (C.E.A.) and Mr. Macreadie (parks superintendent, Southend-on-Sea). With the co-operation of the South-end-on-Sea Borough Council, the Board was able to demonstrate the advantages of soil warming by exhibiting a sectioned greenhouse in which plants were actually growing in electrically warmed soil.

Arrangements are now being made for the exhibition to be used in service centres in other Sub-Areas of the Board.

The Southend gardens exhibition arranged by the Eastern Electricity Board

Manchester Building Trades Exhibition

In the Manchester Building Trades Exhibition, now being held in the City Hall, Deansgate (it ends to-morrow), the exhibits of interest to the electrical industry are not numerous but are surprisingly diverse, comprising mainly domestic applications of electricity, conduit and tube bending tools and machinery, electric tools and high frequency convertors. Much of the heavy woodworking machinery is demonstrated under electric power. The exhibition was opened by Mr. J. R. Bevins, Parliamentary Secretary, Ministry of Works.

Exhibitors included:—S. N. Bridges & Co., Ltd. (portable electric tools); Buck & Hickman, Ltd. (electric tools); Burdin, Baker & Co. (high frequency convertors); Easiclene Porcelain-Enamel (1938), Ltd. (electric washing machines); Electrolux, Ltd. (refrigerators); Hilmor, Ltd. (tube bending tools for the electrical contractor); Inertol, Ltd. (bituminous compounds for hydro-electric schemes and electricity works); W. Kennedy, Ltd. (bending machines); Tellus Super Vacuum Cleaners, Ltd. (industrial suction cleaners); Tubela Engineering Co., Ltd. (hand and motorised tube benders); Warton-Mitchell, Ltd. (electric tools); Yorkshire Copper Works, Ltd. (copper and polythene tubes and joints).

Yorkshire Board Staff Conferences

During the weeks beginning 10th and 17th September the Yorkshire Electricity Board held eight 48-hour staff conferences at Leeds University which were organised on a departmental basis under the control of the appropriate chief officer. In the first week, two engineering conferences were each attended by about fifty members of the engineering staff and two commercial conferences were attended by a similar number of commercial staff.

On the first day of each conference the engineering delegates studied a

paper by the chief engineer on "The Board's Engineering Organisation" and on the second day Mr. C. W. Mott, of the C.E.A. headquarters staff, gave a lecture on "Some Design Aspects of Switchgear for 6·6 kV and 11 kV 150 MVA duty with Special Reference to B.E.S. Specification S.2 and the Associated Explanatory Memorandum." Following the presentation of the paper and the lecture the delegates divided into syndicates to discuss each subject and afterwards the chairmen of the syndicates presented their reports to the whole conference and the chief engineer and Mr. Mott replied to the points raised. Mr. Mott also gave an evening lecture on "Fundamentals of Arc Interruption."

The commercial conferences were organised on similar lines and studied the paper entitled "The Domestic Consumer" which was presented by the chairman of the Board to this year's British Electrical Power Convention and also a paper given by the chief commercial officer on "Public and Consumer Relations."

During the second week two accountancy and two secretarial conferences were each attended by about 50 members of the accountancy and secretarial staff respectively.

Television Studio Equipment

At the B.B.C.'s new Riverside studios at Hammersmith, which have recently come into operational use, the majority of the television equipment has been supplied by Marconi's Wireless Telegraph Co., Ltd. It includes ten camera channels, together with vision mixers of an entirely new type and a considerable quantity of ancillary equipment. Each camera channel consists of a camera, a camera control unit, picture and waveform monitors and associated power supply equipment.

Studio One is equipped with four Marconi Mk. III cameras using 4·5in "Image Orthicons," while Studio Two uses three similar cameras. An additional spare camera is provided in each studio, while a base maintenance spare camera channel has also been supplied.

The vision mixing equipment is of particular interest, being of an advanced type designed to meet B.B.C. specifications. It forms the central unit of an impressive control console and consists of two seven-way "knob-a-channel" mixers in two banks with cross-over mixing facilities between them, thus permitting mixing from one superimposition to another. The signals are switched and faded at video frequency. Another innovation on the console is the provision of 5in waveform monitors in place of the more usual 3in ones, to enable a more accurate examination of the picture waveforms to be made.

The apparatus room of Studio Two at the new B.B.C. Riverside studios showing camera control equipment with 5in waveform monitors and 14in picture monitors

Safety Week in Burma

An Electricity Safety Week was recently inaugurated in Rangoon by the Hon. Bo Khin Maung, the Burmese Minister of Industry. It took the form of an open air "pandal" or exhibition. After hearing an address of welcome by the Government Electrical Inspector, Mr. J. A. Hill, the Minister said that he felt that as the use of electricity was being widely spread, often among many who had never seen electric light before, the people must be trained to be electricity conscious and safety should be the watchword. The exhibition consisted of examples of bad wiring, overloaded cheap plastic wire, articles which had killed people and a liberal supply of posters in English and Burmese. A model of the Balu Chaung hydro-electric scheme drew interested crowds.

Inadequate Installations and Amateur Wiring

A suggestion that local authorities should provide an adequate number of general purpose socket outlets in all new dwellings to help cut down maintenance costs by stopping tenants from extending or altering the wiring to meet their own needs is made by Mr. J. R. Kinnersley (London Electricity Board) in the quarterly bulletin of the Society of Housing Managers. He says experience has shown that where inadequate installations are provided considerable expense is incurred in rectifying faults caused by tenants whose work is often carried out in an amateur fashion, without regard to any wiring or safety regulations, and generally with inferior materials.

Prices of Materials

In the accompanying table we give the basis prices of the more important materials used in the electrical industry. The figures given are the selling prices and are those quoted on Tuesday last.

ALUMINIUM ingots	ton £197 0s 0d
COPPER, H.C. Electro	ton £273 5s 0d
Fire Refined 99·70%	ton £272 0s 0d
Fire Refined 99·50%	ton £271 0s 0d
COPPER Tubes ..	lb 2s 9d
Sheet	ton £343 10s 0d
H.C. wire and strip ..	ton £310 10s 0d
LEAD, English ..	ton £115 10s 0d
Foreign	ton £114 0s 0d
MERCURY	flask £83 10s 0d
TIN, block (English) ..	ton £813 10s 0d
ZINC, G.O.B. Foreign	ton £95 10s 0d
Electrolytic	ton —
BRASS Tubes (solid drawn)	lb 2s 3½d
Sheet	ton £285 5s 0d
Wire	lb 2s 11¼d
PHOSPHOR BRONZE Wire	lb 4s 4¾d
PLATINUM	oz £34 0s 0d
RUBBER, No. 1 R.S.S. spot	lb 26⅜d—26⅞d

Quality Control in Lamp Production

Methods adopted by electric lamp manufacturers to ensure uniform efficiency of their products were explained by Mr. F. J. Burns, Liverpool manager for Cryselco, Ltd., in his address as chairman of Liverpool Centre of the Illuminating Engineering Society at the opening meeting of the session on 9th October. His subject was "Quality Control."

In lamp production, he said, length of life and average efficiency throughout life were the principal measures of quality. Not only was the average efficiency important but so also was the constancy in life about the average value. This was particularly so in the case of a very large scale user. For example, a local authority might find it more economic to renew all its street lamps after a fixed number of hours' burning than to wait until each lamp failed and then send a man and possibly a tower wagon to replace it. Mr. Burns went on to describe the quality control techniques employed in a modern lamp factory in respect of materials and finished product, taking as a pattern the 100 W bayonet cap single coil lamp.

"Minibition" Award

British Oxygen Chemicals, Ltd., was awarded first prize in the display class for its stand at this year's Purchasing Officers' Association "Minibition,"

held at Scarborough. The stands were judged by Sir Stephen Tallents, president of the Design and Industries Association, who also opened the exhibition.

Cableship Returns

The cableship *Ocean Layer*, owned by Submarine Cables, Ltd., has returned after a five-month cable laying expedition to the Pacific where she has successfully laid the electric power cables linking the British Columbia mainland with Vancouver Island. Her next major expedition will probably take her to the South Atlantic where earlier in the year she carried out extensive renewals to existing telegraph cables.

Contract Price Formulæ

The British Electrical and Allied Manufacturers' Association has issued the figures for its contract price adjustment formulæ. In each case the rate of pay for adult male labour at 13th October is deemed to be 175s.

The "cost of materials" figures are: For electrical machinery and equipment the Board of Trade index figure published on 13th October is 188·1. For turbo-generating and allied plant: Materials used in mechanical engineering industries, 178·7, blast furnaces and iron and steel melting and rolling (40 and 41), 167·3. The price of ¾in o/d 18 s.w.g. brass condenser tubes (*Metal Bulletin*, 12th October) is 50¼d per lb.

Synthetic Rubber Plant

The Distillers Co., Ltd., announces that British Geon, Ltd., has begun the erection of a plant to manufacture special purpose synthetic rubbers at Barry, Glamorgan. The new plant will manufacture Hycar butadiene/acrylonitrile copolymers and lattices usually referred to as nitrile rubbers. These synthetic rubbers combine a high degree of oil resistance with excellent mechanical properties. The new plant will be alongside those of British Resin Products, Ltd., British Geon, Ltd., and Distrene, Ltd., the three companies comprising the Distillers plastics group.

New Electric Furnace Factory

As part of a ten-year development plan, Birlec, Ltd., has purchased a 34-acre site at Aldridge, near Birmingham, for the erection of what will, it is claimed, be Britain's largest and most modern electric furnace manufacturing plant.

The first stage of the new factory allows for several bays, totalling approximately 150,000 sq ft, to be completed in 1958. The immediate aim is to provide additional space for fabricating the massive parts of large industrial furnaces and the structures for other Birlec equipment so as to provide additional space for machining, fitting, bricking and final assembly of furnaces. The second and third stages of the scheme are planned for completion in 1961 and 1966, respectively, enabling the gradual transfer of the remaining departments to be effected. Generous provision has been made for improved canteen and recreational facilities and large research and administration blocks are planned, together with a new heat treatment shop.

Artist's impression of the new Birlec factory to be built at Aldridge

Birlec's recently inaugurated apprentice training scheme, which at present allows for an annual intake of about fifty apprentices, is integrated with this expansion project. The newly trained recruits will, to a large extent, fulfil the additional requirements for personnel when the company moves into the new premises.

Falk, Stadelmann Bristol Showrooms

New showrooms for the trade were opened by Falk, Stadelmann & Co., Ltd., on 10th October at 16, Temple Street, Bristol, 1. The opening ceremony was performed by Mr. A. N. Irens, M.I.E.E., chairman of the South Western Electricity Board, and was attended by a number of other distinguished visitors, including Mrs. Murphy, chairman of the E.A.W. Bristol Area, Mr. R. Duminel, chairman of the Bristol Electric Club and the E.C.A. Bristol Branch, Mr. Hill, vice-chairman of the I.E.S. Bristol Centre (representing the chairman), Mr. R. V. Parsons, chairman of the I.E.S. Gloucester Branch, and Mr. N. Axford, vice-president, A.P.L.E.

The new showrooms, which will serve the West of England, are under the management of Mr. W. F. Litherland. They contain a comprehensive selection from the company's range of contemporary lighting fittings as well as a large number of conventional and period fittings. Also on view is a complete range of Falks modern domestic appliances and fires. Attached to the showrooms there is a trade counter where, in addition to the products already mentioned, cables and wiring accessories will be available.

Electricity and Housing

The need for making provision in new houses for using the many domestic electric labour-saving appliances now obtainable is stressed on the stand of the Electrical Development Association at an exhibition held in connection with the National Housing and Town Planning Conference at the Corn Exchange, Brighton, this week (24th-26th October).

A visit to the E.D.A. stand should convince architects, builders and planning authorities that the days are gone when it was sufficient to provide,

Part of the new showrooms opened by Falk, Stadelmann & Co., Ltd., at Bristol

apart from the lighting points, for only one or perhaps two plug points in new houses. Display matter, supported by examples, shows the many domestic appliances available, and the attention of architects is drawn to the advantages of the ring circuit.

B.B.C. Handbook

The 1957 edition of the B.B.C. Handbook records the achievements of the Corporation during the first year in which it has had to face competition in television. Its claims and needs for a second television service are outlined, as well as future projects in the field of colour television, and the establishment of the v.h.f. sound broadcasting network. The section dealing with the finances of the Corporation shows that broadcasting costs increased by more than £2,900,000 during the year ended 31st March last, as compared with the previous year. The Handbook is published by the Corporation, Broadcasting House, London, W.1, price 5s.

Pye Irish Factory

On 15th October Lord Glentoran, H.M.L., M.P., Minister of Commerce in Northern Ireland, opened a large extension to Corran Works, Ltd., the Pye factory in Larne. The extension, which was built for Pye by the Northern Ireland Ministry of Commerce, brings the total area of Corran Works to over 100,000 sq ft. The number of employees at the works is now 700. Products manufactured include domestic radio and television receivers for both the home and the export markets.

Carpet Fibre Preparation

In the article on this subject in our issue of 5th October (page 604) reference was made to the three control panels at the new carpet fibre blending plant of Petmar Industries, Ltd. Gent & Co., Ltd., who provided the panels, have sent us photographs, one of which is reproduced, showing the panels in relation to the plant and their comparative simplicity.

Gent panel controlling part of the plant at the new Petmar Industries factory

Tricity-Fillery Agreement

An arrangement is announced between Tricity Cookers, Ltd., and Fillery (Great Britain), Ltd., under which Tricity will manufacture and market in the United Kingdom certain Fillery products including the model VP1 (a combined cleaner and polisher) and models SP_3 and P_3 (floor polishers). Inquiries regarding sales matters should be addressed to the Cleaner Department, Tricity Cookers, Ltd., 109, Kingsway, London, W.C.2 (telephone: Holborn 2161). Field service and machine repairs for Fillery products will be operated by a new company, Tricity Electric, Ltd., Parsonage Lane, Enfield (telephone: Enfield 4455).

Works Visit

On 10th October Sir Alexander Symon, United Kingdom High Commissioner in Pakistan, visited the Rugby Works of the British Thomson-Houston Co., Ltd. He was received by Mr. W. W. Vinsen (director of manufacture, B.T.H.) and then taken on a tour of some of the factories accompanied by Mr. E. V. Small (managing director, B.T.H. Export Co.) and Mr. H. E. Cox (manager, Rugby Works).

Educational

The University College, London, has issued its Calendar for 1956-57. In addition to a brief history of the college and details of its present organisation, it gives full information on the various prospectuses.

"Exide" Motor Show Luncheon

Mr. A. W. Browne, O.B.E., M.I.E.E., chairman of Chloride Batteries, Ltd., presided at the annual "Exide" Motor Show luncheon at the Clarendon Restaurant, Hammersmith, on 17th October. In proposing the toast of "The Visitors and Press" he referred to the retirement from executive duties of Mr. H. V. Schofield, the appointment of Mr. E. Powell as general sales manager of the Chloride Group and of Mr. A. C. Stewart as sales manager of Chloride Batteries, Ltd.

Mr. Browne said that their trading position at home and abroad had been maintained during the past year. The effect of the recession in the motor car business had not been serious; in fact the number of cars on the roads continued to increase. After reviewing some of the principal events of the year Mr. Browne said that they were well prepared to meet the increasing industrialisation of overseas countries which hitherto had depended largely on imports.

The toast was responded to by Mr. C. Jennings (*The Motor*) and Mr. R. T. Lewis (*News of the World*).

Trade Announcements

The Yorkshire Switchgear & Engineering Co., Ltd., Leeds, announces the appointment of Mr. T. G. Smith as its sales agent in the East Midlands area. His activities will be confined to the N.C.B. and industrial organisations within this area and will be additional to his present activities on behalf of G.W.B. Furnaces (Control Gear Division) and the Mitchell Engineering Group, Ltd.

The "Servis" washer servicing and maintenance depot (**Wilkins & Mitchell, Ltd.**) at Edinburgh is now at 1, Tennant Street, Leith, Edinburgh (telephone: Leith 39230).

The **Pressed Steel Co., Ltd.,** has been licensed by the Whirlpool-Seeger Corporation of St. Joseph, Michigan, U.S.A., to manufacture the Seeger rotary compressor used in refrigerator equipment.

Truvox, Ltd., announces that the **Collins Electric Co.,** of Deramore Avenue, Belfast, Northern Ireland (telephone: Belfast 42001), are now its sales and service agents for floor maintenance machines, tape recorders and tape recording components and accessories.

Following upon the recent registration of the **Siemens-Schuckertwerke Akt.-Ges.** in Great Britain, the British-owned company, **Siemens-Schuckert (Great Britain), Ltd.,** Faraday Works, Great West Road, Brentford, Middx, has been appointed its sole agents in the United Kingdom, Northern Ireland and the Isle of Man.

Nettle Accessories, Ltd., has appointed Mr. H. Clegg as its representative in the Midland area. Mr. Clegg was formerly area representative for Kenwood Electrics, Ltd.

Cosmocord, Ltd., has moved to Eleanor Cross Road, Waltham Cross, Herts (telephone: Waltham Cross 5206).

West Instrument, Ltd., of Brighton, is now represented in the Manchester and Birmingham areas by A. M. Lock & Co., Ltd., and in the West Country by S. L. Installations, Ltd.

Calendar

The first of the 1957 calendars received by us comes from the Brush Group, Ltd. This has large monthly sheets, which in addition show the preceding and following months, and each sheet has a picture in colour of some of the beauty spots in England and Scotland.

LETTERS TO THE EDITOR

Letters should bear the writers' names and addresses, not necessarily for publication. Responsibility cannot be accepted for the opinions expressed by correspondents.

Private Generating Plant

MR. S. G. LAIDLAW'S letter in your 12th October issue refers to my article on this subject, in particular the use and excitation of induction generators, and describes an interesting small private plant.

The use of an induction generator is not *always* inappropriate. In an area of short cables and concentrated loads the heavy magnetising kVA of such a machine is usually supplied directly from the power station generators and may be an embarrassment. This was pointed out in my article as it is often overlooked. However, in a lightly loaded system of long lines the leading kVA taken to charge the lines may be the embarrassment and the installation on the system of apparatus, such as induction generators, which requires lagging kVA may actually be welcome as neutralising some of the unavoidable system capacitance and assisting in maintaining stability. The North of Scotland Hydro-Electric Board's system is presumably one of the latter.

It is difficult to comment with brevity on the small factory system described by Mr. Laidlaw. The following brief remarks will not be understood without reference to his letter. The *simplest* solution would be to install a rectifier fed from the supply system and capable of feeding the present d.c. motor. The waterwheel would also need governing in view of the scrapping of the battery load. However, it would appear that the best course to adopt is as follows. Economic and other factors must be considered, but I restrict myself here to technical points. The supply system could be used for normal governing in place of the battery. The shafting could be coupled both to the existing waterwheel, or to a new turbine, and to an induction or synchronous machine, the latter being connected to the supply system.

At times of low water the supply system would provide most of the power needed, the waterwheel or turbine supplementing this by the maximum possible. The diesel engine could also be coupled to the shafting and take a share in reducing the demand from the system. If the output from the turbine and/or diesel engine exceeded that required by the factory the surplus would be usefully fed to the supply system.

There are no technical difficulties in the way of operating such an arrangement, which has much to commend it from the point of view of a nation short of power. There are obvious difficulties in arriving at a tariff, and one can well understand a certain hesitancy on the part of the supply authority. However, the Central Electricity Authority have expressed a willingness to do all they can to conserve the nation's fuel resources, and it will be interesting to see whether the North of Scotland Board has the same policy.

Rugby. A. J. ELLISON,
Plant Engineering Department,
British Thomson-Houston Co., Ltd.

I HAVE read with interest the letter from Mr. Laidlaw regarding the possible use of an induction motor as a generator. He refers to a previous article in which was outlined the difficulties experienced with this application owing to the large magnetising current which the machine must draw from the line before it can generate.

It may not be generally known that the magnetising current for such a machine may be taken from suitably rated capacitors connected across the machine terminals; in fact the machine can be self-excited by this method without the necessity of being connected to a supply. A possible solution, therefore, to the troubles outlined by Mr. Laidlaw would be to use an induction generator and supply the magnetising current from parallel connected capacitors, the capacity of which could be varied to suit the load requirements.

Erdington, Birmingham. K. MIDDLETON.

THE letter on this subject in your 12th October issue by Mr. S. G. Laidlaw recalls an installation at the mill of Messrs. Laidlaw & Fairgrieve, Ltd., Galashiels. I have no records, but from memory a water turbine was coupled to a Sandycroft "Hunt-Cascade" motor-alternator coupled in turn to the mill drive. The size was about 150 kVA, and arrangement was made for buying electricity from or selling it to the supply authority according to the state of the water power.

In 1949 I inquired as to the condition of the machine, and the company informed me that after operating for about ten years the machinery had been destroyed by fire with the whole of the mill in 1928.

Liverpool. E. W. ASHBY.

Installation Inspection

THE deliberations of the National Inspection Council, and later the Board, must have attracted the interest of most members of the profession as a move in the right direction. It is, therefore, with some concern that it is noted that the advertisements for inspectors call for no specific technical qualifications. Clearly, these inspectors must primarily be good practical men who understand the details of installation work, but it is also essential that they have a minimum technical qualification such as I.E.E. or H.N.C.

It may, of course, have been decided that such qualifications are necessary but it is surely most important that all sections of the industry should know that only inspectors of a high technical standard will be used to judge compliance with codes and regulations. Standards of inspection must be set, not gradually attained.

Manchester, 9. W. MCDERMOTT.

Electricity Boards' Specifications

AS a consumer of electricity supplied by a nationalised Board, maintaining a prompt payment of accounts rendered, may I register my protest at a practice which appears to be a little irregular and unfair to those individuals who are engaged in the field of electrical consulting engineering.

On more than one occasion, it has come to my notice that certain architects and local authorities have obtained free specifications and drawings prepared by the Electricity Boards for electrical works in buildings.

I fail to see why the cost of this free service should be borne by the consumer because the same architects and local authorities are apparently too mean to employ an electrical engineer, or pay the consultants' fees.

I have yet to hear of an architect who has designed a building for an Electricity Board at no fee. No doubt, the free consulting service provided by the Board is still chargeable to the architect's client, by the architect.

Addington, Surrey. J. WILLS.

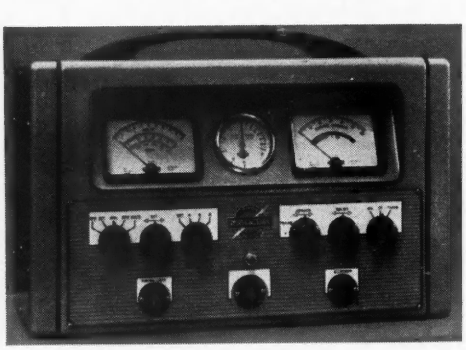
The Motor Show

AT this year's International Motor Exhibition, now being held at Earls Court, London, the products of nearly 540 exhibitors are to be seen. As only 57 of these exhibitors are actually car manufacturers it is obvious that the remainder cover a very wide field, including such items as marine engines, tyres and accessories of all kinds and a very wide range of components for the motoring trades.

Among items of electrical interest are several which are shown for the first time. Nine new products are exhibited by Crypton Equipment, Ltd., who include in their large display battery chargers and testers, independent testers, headlamp aligners, flywheel magneto testers, etc. This company's "Motormaster" is something new in engine testing and is claimed to be the most important single item of equipment which they have yet produced. With this instrument it is possible to check accurately all phases of engine operation in ten minutes with only seven simple tests. It differs from previous types of engine testing equipment, such as motor analysers, in that it operates on a new principle of "area testing." Instead of dealing separately with every single circuit and component, these are divided into groups and single tests check the operation of a whole group at one time. Tests show the condition of various components of ignition, generating, starting, carburation and compression systems and enable the source of trouble to be quickly located. Separate circuits and components can be independently tested if required.

New battery servicing equipment shown by Crypton includes a "Chargemaster" which boosts batteries within 10 minutes or fast-charges batteries in the vehicle in less than one hour. It is also capable of cell charging up to ten batteries at one time and will indicate when batteries are worn out and need replacement. The company also shows a new 6, 12 and 24 V fast charger, the "Magmaster" tester for the ignition and electrical testing of two-stroke engines, the "Fluxmaster," an instrument which shows the magnetic strength of flywheel magnetos, the "Lightmaster" headlamp aligner, and a single range of battery charging metal rectifiers.

C.A.V. exhibits include a representative range of fuel injection equipment for marine diesel engines and a selection of totally enclosed generators for marine duty for battery charging and lighting with maximum outputs of from 250 to 1,320 W. A range of switchboards and control boards for use with the company's charging and lighting equipment is also shown, as well as a selected range of heavy duty lead-acid batteries including a new range of high performance, thin plate types, incorporating patent porous rubber separators with glass wool pads against each positive plate. Other exhibits include 12 and 24 V searchlights and spotlights.



Crypton "Motormaster" engine tester

The "Kama" high-pressure electric grease gun is now being marketed in this country by Headland Engineering Developments, Ltd., and models are demonstrated on this company's stand. The main advantage of a lubricator of this type is its direct electric drive which does not require any other supplementary source of power. It has an effective pressure of 7,100 to 8,500 lb/sq in. This grease gun is not unlike an electric drill in appearance and comprises a high-pressure flexible delivery pipe, 15½in long, fitted with a detachable lubricating head; a push-button switch is incorporated in its pistol type butt handle and in the barrel of the appliance is the grease container which has a capacity of approximately 18 oz.

Crompton Parkinson, Ltd., through their associate company the Young Accumulator Co., Ltd., show for the first time their new ranges of car starter batteries, the "Golden Crompton" and "Double-Duty," each having what is termed a factory sealed charge (F.S.C.). As this term implies, they are of a type that is dry charged during manufacture and then hermetically sealed. Only when they are actually required for service are their seals broken and electrolyte added, the latent dry charge then being quickly activated and the batteries made ready for use.

12 V "Golden Crompton" car battery

"Dagenite" batteries for all makes and types of private cars are shown on the Peto & Radford stand. These are fitted with negative plates filled with a special paste developed to eliminate winter starting troubles. Other special features of this range are the corrosion resistant alloys used in casting the plate grids and "Porvic" microporous plastic separators.

Many of the more popular sizes in the Chloride Batteries "Silver Exide" range are now available with flush tops, the conventional proud intercell connectors being replaced by short U-shaped links bridging the intercell partitions and lying flush with the lids.

The comprehensive range of automobile and electrical components shown by the AC Delco Division of General Motors, Ltd., includes a new windscreen wiper and an electric temperature gauge.

Several 6 or 12 V car accessories are shown by Barnacle, Ltd., whose range includes parking lamps, cigarette lighters, etc., and this year they have introduced a new car interior light designed for easy attachment to any existing driving mirror. Attractively finished in cream plastic and chromium fittings, it is supplied complete with three yards of flex, fixings and switch.

The use of static trainers has proved to be an effective aid to driving tuition and a new machine of this type is to be seen among the British School of Motoring exhibits. Electrically controlled, this Mark V model records electrically in tenths of a second the time taken by a driver to

apply his brakes. Reproduction of brake failure can also be simulated on this machine which is fitted with both centre and steering column gear control for gear changing and other tests; gear movement is electrically recorded so that an instructor can check the sequence of operation.

A complete range of " Osram " bulbs for cars and yachts are displayed by the General Electric Co., Ltd., and these include the newest types of pre-fix headlamp bulbs and bulbs for side lamps, stop and tail lamps, flashing indicators, etc. The G.E.C. also show their " Family " battery charger which is suitable for charging 2, 6 or 12 V batteries and operates at a maximum charging rate of 2½ A.

A recently announced range of car radios, including the first transistorised model on the market outside the United States, is shown by Pye, Ltd., who also include a selection of radio-telephone equipment specially suitable for use in private cars by doctors, etc. Car radios are also shown by E. K. Cole, Ltd., and Philips Electrical, Ltd., who have on view a range of motor car lamps and battery chargers.

The exhibition closes to-morrow (Saturday).

Agreed Prices

ELECTRICAL MANUFACTURERS' DEFENCE

A PRESS conference was held in London last week by the Electrical Manufacturing Industry Public Relations Committee, which represents the major manufacturing companies, at which views were expressed on the need for maintaining a prosperous industry in the interest of national economy and the maintenance of an economic level of prices. It was also intended to show two films, one giving facts about the industry and showing how vital it was to the economic future of the country, and the other dealing with research and education, but the opening address by Mr. E. B. Banks (chief commercial manager, English Electric Co., Ltd.) aroused such a lively and prolonged discussion that there was no time to show the films. Mr. Banks was supported by Mr. W. A. Coates (director, Metropolitan-Vickers Electrical Co., Ltd.) and Mr. T. G. Travis (sales manager, General Electric Co., Ltd.).

In his remarks, Mr. Banks said that it was vital to maintain a reasonably economic level of prices for goods the industry sold. Referring to the Monopolies Commission, he said that it was reasonable that certain practices should be reviewed, but there had been in the last few years a mounting chorus of criticism on practices generally, much of which was uninformed. It had been presented in such a way as to suggest that the people who indulged in them were moral lepers. The industry resented that and believed it had operated these practices because bitter experience had taught it that something of the sort was essential to the stability of the industry, and it had operated them with a full sense of its duty to the community as a whole.

The industry was the second largest exporting industry, but it was being subjected to acute price-cutting competition from abroad in traditional Commonwealth markets, and to preserve their position in certain markets, manufacturers were sometimes forced to sell below cost. If such competition were experienced in the home market, the result would be disastrous.

Justification of Price Fixing

In a statement of the case for agreed prices in the heavy electrical plant industry which was presented at last week's meeting it is contended that it is not correct that price agreement is synonymous with high costs and profits. The system is regarded as a governor, maintaining employment and profit at a reasonable level. The manufacturers concerned in the recent inquiry by the Monopolies Commission told that body that they would be willing to report to the Government, periodically, what their average industry profits were; those figures will stand comparison with those of any other industry. This system would ensure that prices were economic while safeguarding performance, quality, efficiency and safety.

Electrical equipment, with the exception of machinery used by the lighter side of industry, is " tailor-made " and subject to constant development, making it difficult to produce satisfactorily comparable cost returns. For this reason it is not possible to say which firm is the least efficient producer at any one time. Taking the average of all is the only practicable method and the average industry profit alone is of any public significance.

Reliability is usually more important than prime cost. Instances are cited where the value of daily output is up to 50 per cent of the cost of the electrical equipment employed. A large proportion of electric motors sold are so employed that the total daily value of the product is much greater than the cost of the motor.

Research and Development

Heavy electrical plant manufacturers spend from eight to nine million pounds a year on research and development, not all of immediate application. Advances in development aimed at producing machines with a lower capital cost per unit of output or lower cost of operation require the preparation of new designs and often new factory equipment, and sometimes new and larger factory buildings.

In the matter of education and training employers spend about £500 a year for each craft apprentice: future professional men cost twice as much.

Public men have frequently said that while there may have been a need for sellers to get together during the inter-war slump so as to avoid bankruptcy there is no need for it in present economic circumstances. It has not occurred to these critics that it is possible that those circumstances and the improved well-being of all workers may have been brought about by these practices.

Before the first world war and during part of the inter-war period a large proportion of capital invested in the industry secured no return. Since the last war dividends have been paid at an average rate of 5 per cent on the capital employed. It has been a period of continued inflation; the existence of a level price agreement provides a ready means of passing on to the customer all such increases in cost but in fact that has not been done.

The Monopolies Commission has examined the manufacturers' trading accounts for 1951 and 1952, two years in which home and export business were equally profitable. Since then the situation has changed and ex-enemy countries are again competing strongly, to fill modern factories acquired at the victors' expense.

It is believed by the manufacturers that their price fixing methods are necessary to give an assured income for research, development and education, and fair because the general price level is no more than is required to provide adequate contribution towards future capital needs and moderate dividends for the shareholders.

Financial Section

STOCKS and SHARES

FOLLOWING the opening ceremony at Calder Hall, there was a good rally in the shares of companies importantly concerned with the future of nuclear power. Support for the General Electric Company's newly issued ordinary shares and loan stock was also among the best features of the past week in the industrial markets of the Stock Exchange. As very often happens on these occasions, the new G.E.C. ordinary shares went ahead as soon as the date for the payment of the first instalment of 20s per share had passed, marking the end of the period during which the selling of the "rights" to an issue of this kind is usually at its heaviest. The premium on the issue price of 40s widened subsequently to over 4s, whereas in the earlier stages it had been around 2s. The shares will continue to be transferable free of the usual 2 per cent stamp duty until the final call of another 20s per share falls due early in January.

G.E.C. Loan Stock

Persistent buying of the new G.E.C. 6 per cent unsecured loan stock 1976/81, of which £6 million was offered to stockholders of the company at par, lifted the premium to over 2 points. At an all-in price of 102½, buyers still obtain a yield of £5 17s 0d per cent on the money and, as in the case of the new ordinary shares, the present freedom from transfer stamp duty on purchase is an additional and material recommendation. The success of this issue has been assisted by a distinctly harder tendency in the gilt-edged market, the improvement being born of an idea that the Government's dear money policy has now been pushed to as high a level as it can usefully go, and that the attractive yields which it has produced among Government and high-grade industrial fixed-interest stocks will not be available indefinitely to the investor.

"Atomic" Shares Favoured

A rebound of 7s 6d, to 93s 9d, in the price of C. A. Parsons ordinary led the way in the general revival of "atomic power" shares. Reyrolle did almost equally well in rising 6s 3d, to 103s 9d. A.E.I. and English Electric also improved, with assistance indirectly from the good progress of the G.E.C. issues. Radio shares were helped by the E.M.I. results. Decca "A" were particularly firm at 29s, on talk of important new contracts. Metal Industries, under the influence of the review of affairs at the recent meeting, regained another 2s 3d, to 24s 3d. Aerialite remained firm in advance of the dividend declaration, and better prices were marked in B.I.C.C., Strand Electric (after the full report), Taylor Tunnicliff and Duport. Watford Electric were called 6s 6d ex-rights to the new issues, of which the ordinary shares began at a premium of 1s 9d on the offered price of 4s 9d.

Other New Issues

A call of 20s per share falls due to be paid to-day (Friday) on the new

Price Changes in

Company or Board	Nom. Value	Middle price 22nd Oct.	Week's Rise or Fall	Dividend Previous	Dividend Last	Yield %	1956 Highest	1956 Lowest
Gilt-edged Stocks						£ s d		
Brit. Elec. 1968/73	100	74½		3	3	4 0 6	80½	73½
Brit. Elec. 1974/77	100	72½		3	3	4 2 9	79⅝	71⅛
Brit. Elec. 1976/79	100	76½		3½	3½	4 11 6	84	76½
Brit. Elec. 1974/79	100	86½		4¼	4¼	4 18 3	95	86½
Overseas Electric Supply								
Calcutta Elec.	£1	19/3x.d.		6†	6†	6 4 9†	20/9	19/-
East African Power	£1	20/-		7	7	7 0 0	21/3	19/6
Nigerian Elec.	£1	17/6		10	10*	11 8 6	21/-	17/-
Perak Hydro-Elec.	£1	15/6x.d.		10	10*	12 18 0	17/6	14/9
Equipment and Manufacturing								
Aberdare Cables	5/-	12/-		17½	17½	7 5 9	13/6	10/6
Aerialite	1/-	5/6	+3d	88⅛	45*	8 3 9	6/9	4/9
Allen, W. H.	£1	38/9		20	10*	5 3 3	39/-	33/6
Aron Elec. Ord.	£1	55/6		15	15	5 8 0	56/-	53/6
Assd. Automation	10/-	17/-	−6d	10	5	2 18 9	19/-	17/-
Assoc. Elec. Ord.	£1	63/9	+1/3	14	15	4 14 0	85/6	57/9
Automatic Tel. & El.	£1	53/9x.r.		15	15	5 11 6	72/6	56/3
Babcock & Wilcox	£1	73/9	+6d	15	15	4 1 3	85/6	64/-
Baldwin, H. J.	2/-	5/-		20	20	8 0 0	5/-	3/9
Bakelite	10/-	26/-		16	16	6 3 0	34/-	26/-
Berry's Electric	5/-	6/-		—	10‡	8 6 9	6/6	5/9
British Aluminium	£1	65/6		12	12	3 13 3	78/9	40/6
B.I. Callender's	£1	50/3	+1/6	10	12½	4 19 6	54/3	45/-
B.I. Callender's 6% Pref.	£1	21/9		6	6	5 10 3	22/6	20/3
British Tabulating	£1	47/6	−6d	9	9	3 15 9	51/3	37/3
British Thermostat	5/-	25/-	−1/3	20	25	5 0 0	31/9	24/6
British Vac. Cleaner	5/-	7/9		30	15*	9 13 6	8/9	6/-
Brook Motors	10/-	35/-		20	25	7 2 9	44/-	31/9
Brush Group	5/-	6/-		10	10	8 6 9	7/9	5/9
Bulgin, A. F.	1/-	4/9		45	50	—	5/3	4/3
Burco Dean	5/-	9/-		—	22½	12 10 0	13/6	8/3
Chloride El. Storage "A"	£1	62/-		17½	17½	5 13 0	73/6	60/9
Clarke Chapman	£1	116/3		20	22½	3 17 6	123/-	89/6
Cole, E. K.	5/-	16/3		17½	17½	5 7 9	22/3	15/6
Cossor, A. C.	5/-	6/-		15	Nil	Nil	10/3	5/-
Crabtree	10/-	24/-		20	20	8 6 9	29/3	24/-
Crompton Parkinson Ord.	5/-	13/-		20	16*	6 3 0	15/-	12/3
De La Rue	5/-	16/3		30	30	9 4 6	20/3	15/-
Decca "A"	4/-	29/-	+2/9	56¼	43¾*	6 0 9	44/9	24/9
Desoutter	5/-	31/-		25	30	4 16 9	32/9	25/9
Dewhurst	2/-	5/6		24	30	—	7/6	5/3
Dictograph Tel.	2/-	7/3		20	20	5 10 3	6/9	5/6
Dubilier Condenser	1/-	5/-		25	30	6 0 0	4/9	3/6
Duport	5/-	19/3	+6d	23	25‡	6 9 9	21/6	13/9
E.M.I.	10/-	27/-	+9d	15	15	5 11 0	37/-	25/6
Electrical Components	5/-	15/-		25	25	8 6 9	16/-	12/6
Elec. Construction	£1	23/9		8½	8½	7 2 3	29/9	23/9
Elliott Bros.	5/-	27/6		19	17½*	3 3 9	36/9	24/6
Enfield Cable Ord.	£1	15/-		Nil	Nil	Nil	19/3	13/6
English Electric	£1	46/3	+1/3	12½	12½	5 8 0	66/3	45/-
English Electric 3¾% Pref.	£1	13/-		3¾	3¾	5 15 6	14/6	12/6
Ericsson Tel.	5/-	35/6x.d.	−1/-	20†	20†	2 16 3†	42/9	33/6
Ever Ready	5/-	28/9	+6d	35	35	6 1 9	32/9	24/-
Falk Stadelmann	£1	36/3		15	17½	9 13 0	45/9	36/9
G.E.C. Ord.	£1	43/9	+1/3	12½	14	6 8 0	65/6	42/6
G.E.C. 6½% Pref.	£1	22/-		6½	6½	5 18 3	23/9	21/3
General Cables	5/-	12/3		30	30	12 5 0	13/9	11/3
Greenwood & Batley	£1	46/3		17½	17½	7 11 3	47/6	45/-
Hackbridge Holdings	5/-	22/3		25	30	6 14 9	24/6	18/9
Hackbridge & Hewittic	5/-	17/6		30	23*	6 11 6	22/-	17/3
Heatrae	2/-	3/9		15	15	8 0 0	5/1	3/9
Henley's	10/-	15/9	+6d	10½	11½	7 6 0	19/9	14/-
Holophane	5/-	20/6	−6d	30	30	7 6 3	21/6	17/-

The above quotations are based upon middle prices in the Stock Exchange Daily Official List.
* After scrip issue. † Free of income tax. ‡ Dividend forecast.

Automatic Telephone & Electric £1 ordinary shares, of which 700,000 are offered to shareholders of the company at a price of 46s. At the beginning of the week they commanded a premium of 8s. On the subject of dividend prospects after this increase of capital, the directors have indicated for the existing ordinary and deferred capital a total of 15 per cent (of which 3 per cent has already been paid as an interim) and a payment of 12 per cent (actual) on the new issue. Dealings took place this week in another "rights" issue, when Switchgear & Cowans' new 5s ordinary opened at a premium of 2s 6d on the price of 10s 6d at which 200,000 shares were offered to the company's shareholders. A final dividend of 15 per cent on the increased capital is anticipated, and on the basis of a full year's distribution of 25 per cent there is a prospective yield of over 9½ per cent on the new shares at an all-in price of 13s (free of transfer stamp).

Electrical Investments

Company or Board	Nom. Value	Middle price 22nd Oct.	Week's Rise or Fall	Dividend Previous	Dividend Last	Yield % £ s d	1956 Highest	1956 Lowest
Equipment and Manufacturing—continued								
Hoover	5/-	23/-		70	50	10 17 6	39/3	23/-
I.C.I.	£1	41/6	+1/3	10	10	4 16 6	49/9	39/9
Intl. Combustion	5/-	19/6		25	20*	5 2 6	25/-	15/3
Johnson & Phillips	£1	38/3		15	15	7 16 9	46/6	37/6
Lancashire Dynamo	£1	41/9		15	11*	5 5 6	49/9	40/9
Laurence, Scott	5/-	15/3		12½	15	4 18 3	16/9	13/3
Lister, R. A.	£1	28/3	−1/3	9·3	10	7 1 6	35/3	27/6
London Elec. Wire	£1	45/-x.d.		12½	12½	5 11 0	52/9	45/-
Lucas, J.	£1	31/3	+9d	7½	7½	4 16 0	40/3	29/6
Marryat & Scott	2/-	9/6		30	30	6 6 3	11/3	9/6
Mather & Platt	£1	55/-		15	15	5 9 0	65/3	51/6
Metal Industries	£1	24/3	+2/3	9	9	—	27/-	16/3
Midland Elec. Mfg.	£1	45/-		10	12½	5 11 0	48/6	43/6
Morphy-Richards	4/-	25/-	−1/3	50	50	8 0 0	27/3	20/-
Murex	£1	71/9	−9d	20	20	5 11 6	74/6	60/-
Newman Ind.	2/-	2/3		10	10	8 17 9	2/9	2/1
Oldham & Son	1/-	2/6		20	17½*	7 0 0	3/-	2/3
Parnall (Yate)	5/-	5/6		14	12	10 18 3	9/6	5/6
Parsons, C. A.	£1	93/9	+7/6	10	10	2 2 9	96/-	61/6
Plessey	10/-	65/6	−1/-	27½	30‡	4 11 6	87/6	56/-
Pye "A" Deferred	5/-	14/6	−6d	12½	12½	4 6 3	21/3	14/-
Reyrolle	£1	103/9	+6/3	15	16½	3 4 3	117/6	81/-
Rheostatic	4/-	9/9		18½	12‡	4 19 0	—	8/3
Richardsons Westgarth	5/-	16/-		16⅔	16⅔	5 4 3	17/-	13/9
Scottish Cables	4/-	15/9		27½	27½	6 19 3	17/9	15/9
Smith (England), S.	4/-	11/-	+6d	17½	17½	6 7 3	14/3	10/6
Southern Areas	£1	15/-		10	7½	10 0 0	28/9	15/-
Strand Elec.	5/-	8/3x.d.	+9d	15	15	9 1 9	8/6	6/9
Sturtevant	5/-	23/9	+3d	14·4†	15†	3 3 3†	31/3	22/6
Sun Elec.	£1	35/-	+1/3	15	20	11 8 6	37/6	33/9
Switchgear & Cowans	5/-	12/6x.r.		20	25	10 0 0	17/-	13/6
Taylor Tunnicliff	5/-	12/9	+1/6	15	15	5 17 9	14/-	11/3
T.C.C.	10/-	36/3		25	25	6 18 6	45/-	36/3
T.C. & M.	£1	26/6	+6d	8½	8½	6 8 3	34/-	26/-
Telephone Mfg.	5/-	7/-		10	10*	7 2 9	8/6	6/3
Thorn Elec.	5/-	18/3	+3d	15	15	4 2 3	22/6	16/-
Thornycroft	£1	43/9	−1/3	15	15*	6 17 3	49/9	41/3
Tube Investments	£1	56/3	+1/3	22½	14*‡	4 19 9	70/6	54/9
Vactric	5/-	13/6		15	17½*	6 9 9	15/-	11/6
Veritys	5/-	9/-		12½	12½	6 19 0	10/-	6/9
Walsall Conduits	4/-	12/9		70	20*	6 5 6	13/6	10/9
Ward & Goldstone	5/-	37/6	−6d	30	35	4 13 3	39/6	29/-
Watford	2/-	6/6x.r.		25	25	7 13 9	7/6	6/-
Westinghouse	£1	72/6		18	18	4 19 3	100/-	71/6
West, Allen	5/-	12/-		15	15	6 5 0	14/6	11/6
Wolf Electric	5/-	17/6		20	20	5 14 3	26/3	17/6
Trusts, Transport and Communications								
Anglo-Portuguese	£1	21/9		8	8	7 7 0	23/6	20/3
British Elec. Traction: Def. Ord. "A"	5/-	17/6	−1/-	22½	22½	6 8 6	20/-	15/6
Cable & Wireless: Ord.	5/-	10/6		10	10	4 15 3	11/3	9/6
4% Loan	100	90⅛		4	4	4 8 6	92½	88
Calcutta Trams	£1	26/9		6†	7½†	5 12 3†	27/6	23/-
Cape Elec. Trams	£1	16/3		8	8	9 17 0	20/3	18/-
Marconi Marine	£1	31/6	+6d	10	10	6 7 0	34/-	31/-
Oriental Tel. Ord.	1/-	70/-		16	—	—	90/-	67/6
Telephone Rentals	5/-	11/-		12½	12½	5 13 9	11/9	9/9

E.M.I. Results

Having regard to the difficulties affecting business in some of the products of the Electric & Musical Industries group, the annual results of the company had been awaited with some trepidation, which proved in the event to have been unnecessary. Trading profits for the year ended in June have come out nearly half a million higher than in the previous twelvemonth, and although heavier taxation has restricted the improvement in the net figure to under £40,000, the company is able comfortably to maintain the dividend at the previous total of 15 per cent. The payment is covered more than twice by the available surplus. Pending the issue of the full report, which usually shows how the profits are divided between the home and the overseas members of the group, it is assumed that the relatively new acquisition of Capitol Records will have contributed much to the improvement in earnings. At 27s "Emmies" 10s shares show a return of about 5½ per cent.

Bowthorpe Holdings Interim

The 2s ordinary shares of Bowthorpe Holdings were dealt in at a little over 12s following the company's announcement of an increase in the interim dividend from 10 to 12½ per cent, and of the intention (subject to the unforeseen) of maintaining the final at the previous rate, making a total of 37½ per cent for the current year. The present price of the shares is well above the figure of 8s 9d at which they were marketed in July of last year, when the boom in the industrial market was at its peak. The annual report showed a marked expansion of earnings and well over fourfold cover for the 35 per cent rate of dividend paid for 1955.

Broxlea Holdings

Activity in the 1s ordinary shares of Broxlea Holdings at around 3s, or a little over, has lately been attracting attention. The shares were introduced to the Stock Exchange in April of this year. The company was described in the prospectus as being contractors to the telecommunication and electronic industries. The business was stated to be working to capacity, and this year's profits were expected, with the usual reservations, to be at least £33,000. On the basis of that figure the directors anticipated a dividend at the rate of 30 per cent per annum. The prospective yield on the shares is thus bordering on 10 per cent.

REPORTS and DIVIDENDS

Electric & Musical Industries, Ltd.—The consolidated profit for the year ended 30th June last is £2,445,000, as compared with £1,980,000 for the preceding year, and after deducting £1,500,000 for taxation and £73,000, minority interests, the net profit is £872,000 (against £832,000). Of this £429,000 is retained by subsidiary companies, leaving £443,000 to be dealt with in the accounts of the parent company. It is proposed to pay a dividend of 12½ per cent for the year and a bonus of 2½ per cent (both unchanged).

J. & F. Stone Lighting & Radio, Ltd., reports a gross income of £1,198,758 for the year to 30th June last, as compared with £980,850 for 1954-55, and profits of £1,041,817 (against £833,578). Taxation absorbs £520,034 and the net balance is £521,783 (£433,118). The dividend for the year is maintained at 50 per cent by a final payment of 30 per cent and a bonus of 10 per cent. Reserves receive £200,000 and £338,240 is carried forward (against £260,707 brought in). Subject to the consent of the Capital Issues Committee, it is proposed to make a one-for-one scrip issue.

The Watford Electric & Manufacturing Co., Ltd., is to raise new capital of approximately £85,500 by the issue of new preference and ordinary shares to preference and ordinary shareholders. The issues are on the basis of three 10s preference shares at 10s less a commission of 1s, for each ten 10s preference shares held, and one 2s ordinary share at 4s 9d for each eight 2s ordinary shares held.

Peto Scott Electrical Instruments, Ltd., reports that after providing £36,500 for taxation, the net profit for the year to 30th June last is £34,904, as compared with £61,176 for the preceding year. General reserve receives £30,000 and it is proposed to pay a dividend for the year of 16⅔ per cent on £60,000 capital. A similar distribution was made in the previous year, but was paid on £30,000 before a rights issue. The balance carried forward is £55,393 (against £56,239 brought in).

Hopkinsons, Ltd., has declared an interim dividend of 10 per cent (unchanged).

The Ever Ready Co. (Gt. Britain), Ltd., has announced an interim dividend of 10 per cent (unchanged).

The Ever Ready Trust Co., Ltd., is paying an interim dividend of 6 per cent (against 7 per cent) on increased capital.

New Companies

Dempsey & Co. (Clapham), Ltd.—Registered 3rd October. Capital £100. Manufacturers, repairers, servicers and hirers out of and wholesale and retail dealers in radio, electrical and mechanical apparatus of all kinds, etc. Directors: F. E. Hull, Minnie Hull and Doreen L. Priest. Regd. office: 69, South Side, Clapham Common, S.W.4.

Sturtevant Engineering Co. (Australasia), Ltd.—Registered 10th October. Capital £100,000. Mechanical and electrical engineers, etc. Solicitors: Linklaters & Paines, 59/67, Gresham Street, E.C.2.

Capothene Cables, Ltd.—Registered 9th October. Capital £100. Manufacturers and merchants of electric cables and plastic materials, electrical, mechanical and metallurgical engineers and contractors, etc. Solicitors: Lupton & Fawcett, 26/7, Bond Street, Leeds.

Telebrighton, Ltd. — Registered 9th October. Capital £100. Manufacturers of and dealers in and repairers of and hirers of electrical and mechanical apparatus, etc. J. A. C. Derkin is the first director. Regd. office: 56, Preston Road, Brighton.

Liquidation

Redco Electrical Co., Ltd.—Particulars of claims by 27th October to the liquidator, Mr. R. L. Davis, Bedford Row House, 58, Theobald's Road, London, W.C.1.

Bankruptcies

F. Simons, 15, The Council House, Winchcombe Road, Sedgeberrow, Evesham, Worcs, electrical contractor.—First dividend of 10s in the £ payable at 126, Colmore Row, Birmingham, 3.

G. C. Pinney and **A. E. Miller,** trading as Granby Service Co., at 4, Granby Street, Littleport, Cambs, radio and electrical dealers.—Supplemental dividend of 2d in the £ payable at 41, Sidney Street, Cambridge.

G. W. South, carrying on business as G. W. South & Co., at High Street, Navenby, Lincs, radio and electrical engineer.—Receiving order made 1st October on a creditor's petition. Public examination 6th December at the Guildhall, Lincoln.

TRADE MARKS

APPLICATIONS have been made for the registration of the following trade marks. Objections may be entered up to the dates mentioned:—

3rd November

PULSPAK. No. 755,425. Class 9. Electrical capacitors (condensers).—Dubilier Condenser Co. (1925), Ltd., Ducon Works, Victoria Road, North Acton, London, W.3.

CONTEREX. No. 755,481. Class 9. Electric cables, insulated electric wires and insulated electric strips.—Connollys (Blackley), Ltd., Blackley Vale Mills, Blackley, Manchester, 9.

ALBA (design). No. B753,270. Class 11. Electric lamps.—British Luma Co-operative Electric Lamp Society, Ltd., 95, Morrison Street, Glasgow, C.5.

10th November

STAVOLT. No. 756,526. Class 7. Dynamo electric machines.—British Thomson-Houston Co., Ltd., Crown House, Aldwych, London, W.C.2.

M-A-G-N-E-M-A-T-I-C. No. 755,168. Class 9. Electrical apparatus; and photographic and cinematographic apparatus.—F. W. C. Parkins, 71, Dean Street, London, W.1.

New Alfa-Laval Laboratories

New process laboratories have recently been opened by the Alfa-Laval Co., Ltd., at its premises on the Great West Road, Brentford. The building includes process, engineering and chemical laboratories, a photographic section, library and technical offices. The process laboratory includes a range of pilot scale centrifugal separators which are primarily intended for the processing of customers' samples. In addition there is an engineering laboratory which is used for larger scale development, particularly on new equipments, including especially washing equipment for machine parts, oil purifying equipment for turbine, diesel and transformer oils, plate heat exchangers for all heat transfer problems, as well as stainless steel pumps, oil filters, etc. The chemical laboratories are used not only for chemical checks on works carried out in the process laboratory but also on field work carried out on full scale centrifuges, etc. These laboratories also maintain material checks for the production factory.

Part of the engineering testing laboratory which forms a section of the new Alfa-Laval laboratories at Brentford

GENERATION AND DEVELOPMENT

Output and Plant Capacity

In September a further 182 MW was added to the country's generating plant capacity, including 29 MW in the North of Scotland. The month saw the commissioning of the first unit —a 60 MW English Electric turbo-generator and 540,000 lb/hr John Thompson boiler—at the new Tilbury "A" station. A small diesel station (Machynlleth) was officially opened in Mid-Wales, the plant consisting of three 1·33 MW Mirrlees, Bickerton & Day sets. Other new plant installed during the month at C.E.A. stations included a 300,000 lb/hr Clarke Chapman boiler at Goldington, a 515,000 lb/hr Babcock & Wilcox boiler at Meaford "B," a 60 MW G.E.C. set at Ince, a 550,000 lb/hr Clarke Chapman boiler at Stella North, a 150,000 lb/hr Bennis boiler at Northampton and a 30 MW Richardsons Westgarth set at Ocker Hill "A."

The monthly statement issued by the Ministry of Fuel and Power shows that 6,384 million kWh was generated last month by the Central Electricity Authority, the South of Scotland Electricity Board and the North of Scotland Hydro-Electric Board, an increase of 6·6 per cent as compared with September, 1955 (see table). In addition to electricity sent out for public supply, the Ministry publishes details of electricity generated by industry (excluding railways, transport undertakings, coal mines, gas works and petroleum refineries). In the five weeks ended 29th September 909·4 million kWh was generated, an increase of 4·6 per cent as compared with the corresponding period of 1955. So far this year 7,138·9 million kWh (1·5 per cent increase) has been generated by the industries included in the return, of which the chief are the chemicals industry (2,056·5 million kWh), iron and steel (1,639·8 million kWh) and the paper industry (1,547·9 million kWh).

Atomic Power in South West

Pointing out that approval had already been given for the siting of one of the first two commercial nuclear power stations near Berkeley, on the Severn Estuary, Mr. A. N. Irens, chairman of the South Western Electricity Board, said last week that it was reasonable to assume that, particularly in the early stages of the nuclear development programme, a number of atomic power stations would be sited in the West Country. He was speaking at a lunch in Bristol to commemorate the 50th anniversary of the foundation of the Institution of Post Office Electrical Engineers. This was of special significance in the South West where they were faced with high charges for the cost and transport of coal. Next year there would be at least seven commercial atomic power stations under construction in Britain, costing from £170 million to £200 million.

Minimising Supply Failures

Plans for safeguarding supplies in its area have been announced by the North Eastern Electricity Board. Mr. T. M. Ayres, the Board's chairman, addressing a meeting of the Electricity Consultative Council, said that the number of consumers had increased during the past eight years from 650,000 to 920,000 and the maximum demand from 589 to 977 MW. It was estimated that by 1964-65 the maximum demand would be about 1,500 MW. To deal with this increased load, and at the same time improve the security of the Board's supplies, it was intended to develop an inner ring which would operate at 132 kV and an outer ring operating at 275 kV.

This scheme, which would be carried out in the next two to five years, would allow the Board's 66 kV system to be split into blocks. In the event of a failure in any of the blocks it would be possible, by means of interconnections, to restore the supply quickly. Mr. Ayres said this system would meet practically all emergencies. A programme of such magnitude and involving considerable capital outlay could only be carried out in stages, and the first stage was well under way.

Mr. Ayres said that a 275 kV supply point was being established at Blyth (Northumberland) and would be fed, in the initial stages, from the Stella stations. This would reinforce the system in Northumberland and part of Tyneside, and improve security. The Grangetown and Wilton areas of North Yorkshire, where there was a heavy load concentration, would be supported by 275 kV lines from Blyth. Owing to growth in demand in the York and Harrogate Sub-Areas, it was proposed to establish an additional bulk supply point at Wormald Green near Ripon which would be fed by a 132 kV line from Husthwaite.

M.E.B. Asks for More Capital

Members of the Midlands Electricity Consultative Council, at their meeting at Stafford on 15th October, were told by the chairman of the Board, Mr. W. S. Lewis, that the Board had been compelled to ask for an increase in its capital allocation for the current year.

Mr. Lewis, who was attending the meeting by invitation to answer questions on the Board's annual report, said that original applications for capital from the seven Sub-Areas amounted to £8,000,000. This had been pruned to £7,200,000, but they had been allowed only £6,300,000. In terms of to-day's values it was probably rather less than the £4,300,000 capital spent during the Board's first year, and bearing in mind that the M.E.B. had added 380,000 new consumers it represented the lowest proportionate increase in capital expenditure of any Board.

Following a careful investigation of the capital requirements of the Sub-Areas, managers had been allocated figures and told that they must not be exceeded, but under pressure from the Sub-Areas the Board had been compelled to ask for more money, and he understood that they were not the only Board to do so. "We are a growing industry and we believe we are contributing to the economic prosperity of the country. We are battling under very great difficulties at the moment," he said.

Since the estimates were prepared their capital needs had increased by £250,000 for unexpected but urgent industrial development and by £150,000 for new housing over and above estimates based on figures obtained from local authorities. They had virtually halted standardisation work and were being obliged to take certain risks in deferring reinforcement work to meet the growing load. So far as rural development was concerned, they had been asked not to make it the "Cinderella" of the capital cuts. It was not by any means being abandoned, but there might be some delays with certain schemes.

ELECTRICITY GENERATED AND PLANT INSTALLED

	Fuel consumed Thousand tons			kWh generated Millions			kWh sent out Millions	Installed capacity (m.c.r.) MW
	Coal	Coke and Breeze	Oil	Steam	Water power	Total		
Central Electricity Authority ...	3,087	52	23·7	5,847	10	5,865	5,499	21,422
North of Scotland H.E.B. ...	23	—	1·1	35	87	126	124	777
South of Scotland E.B.	192	5	0·1	364	29	393	373	1,218
Total for September, 1956 ...	3,302	57	24·9	6,246	126	6,384*	5,996	23,417
Corres. total for September, 1955	3,173	58	12·2	5,937	40	5,988	5,615	21,478
Inc. or dec., per cent	+4·1	−1·5	+104·8	+5·2	+216·5	+6·6	+6·8	+9·0
Total to date (9 months), 1956 ...	32,191	684	294·8	61,582	1,065	62,770	58,962	
Total for corres. 9 months of 1955	30,084	791	161·5	56,499	825	57,443	53,972	
Inc. or dec., per cent	+7·0	−13·5	+82·6	+9·0	+29·2	+9·3	+9·2	

* The total figure includes generation by other methods amounting to 12 million kWh.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (3s 0d each including postage) will be obtainable after 31st October from the Patent Office, 25, Southampton Buildings, London, W.C.2.

1951

22300. Macfarlane Engineering Co., Ltd., Macfarlane, J. C., and Macfarlane, W. I.—Electric generators. 27th November, 1952. (760101.)

1952

28511. General Electric Co.—Reclaimed silicone rubber. 12th November, 1952. (760004.)

31619. Walter Instruments, Ltd.—Electromagnetic vibrators. 9th December, 1953. (760222.)

32759. Decca Record Co., Ltd.—Microwave apparatus. 24th December, 1953. (760317.)

1953

11. Griffin & George, Ltd.—Variable resistance electrical resistance boxes and variable inductance electrical inductance boxes. 2nd February, 1954. (760318.)

1846. Taylor (Birmingham), Ltd., C.—Pedal mechanisms for operating electric switches controlling arc electrical machine. 15th March, 1954. (760106.)

4113. General Electric Co.—Transformer protective switches. 13th February, 1953. (760107.)

7131. Ferranti, Ltd.—Measuring apparatus. 9th June, 1954. (760321.)

12342. Young, S. G.—Pins for plug type electric couplings. 4th August, 1954. (760326.)

16512. Electric & Musical Industries, Ltd.—Electric filters for transmission lines. 16th June, 1954. (760331.)

20361. British Thomson-Houston Co., Ltd.—Radar equipment. 22nd October, 1954. (760482.)

20535. Murphy Radio, Ltd.—Tuning electric oscillatory circuits. 25th October, 1954. (760332.)

21372. Bradley, Ltd., G. & E.—Automatic calibrator employing electronic and photographic methods for the calibration of heterodyne wavemeters. 19th July, 1954. (760118.)

22765. National Research Development Corporation.—Transistor oscillators. 27th August, 1954. (760229.)

23151. Accumulatoren-Fabrik Akt.-Ges.—Electric accumulators. 21st August, 1953. (760014.)

23625. Peppers of Woking, Ltd.—Electrical connectors. 26th November, 1954. (760231.)

24043. British Thomson-Houston Co., Ltd.—Glass-to-metal-seals. 10th August, 1954. (760485.)

24206. Siemens Electric Lamps & Supplies, Ltd.—Light reflectors. 27th August, 1954. (760120.)

24453. Electric & Musical Industries, Ltd.—Cleaning appliances. 6th September, 1954. (760232.)

24538. Standard Telephones & Cables, Ltd.—Phase discriminator. 4th September, 1953. (760015.)

26654. Metropolitan-Vickers Electrical Co., Ltd.—Linear accelerators. 28th September, 1954. (760235.)

27191. Thorpe, Ltd., F. W., and Thorpe, F. W.—Fluorescent electric lighting installations. 3rd January, 1955. (760402.)

28505. British Thomson-Houston Co., Ltd.—Electric switches and contact arrangements therefor. 15th October, 1954. (760404.)

29014. Thorpe, Ltd., F. W., and Thorpe, F. W.—Electric lighting installations. 19th January, 1955. (760405.)

29322. National Research Development Corporation.—Electrical code comparator for comparing two coded numbers. 22nd October, 1954. (760336.)

29559. General Electric Co.—Insulating structures. 26th October, 1953. (760338.)

29900. Barfreeze, Ltd.—Electric heating temperature-controlling means. 27th September, 1954. (760126.)

30060. General Electric Co.—Thermal insulation. 30th October, 1953. (Addition to 752873.) (760339.)

30095. Standard Telephones & Cables, Ltd.—Computing systems. 22nd October, 1954. (760239.)

30185. Parsons & Co., Ltd., C. A.—Power control systems for gas turbines. 10th December, 1954. (760240.)

31162. Pestarini, J. M.—Synchronous motors. 10th November, 1954. (760244.)

31801. Leischner, G.—Asynchronous generators. 17th November, 1953. (760026.)

33650. Broberg, W. O. V.—Electrical resistance units. 3rd December, 1953. (760029.)

33771. English Electric Co., Ltd.—Methods of bonding carbon and a metal. 3rd December, 1954. (760246.)

34289. Metropolitan-Vickers Electrical Co., Ltd.—Electrical heating elements. 23rd November, 1954. (760129.)

34921. Jackson Electric Stove Co., Ltd.—Electric cookers. 14th December, 1954. (760247.)

35791. General Electric Co., Ltd.—Electric circuit arrangements for operating from an a.c. supply two or more electric discharge lamps. 22nd December, 1954. (Addition to 730024.) (760348.)

36053 and 36055. Western Electric Co., Inc.—Travelling wave tubes. 29th December, 1953. (760133 and 760033.)

1954

4935. London Transformer Products, Ltd., and Philpot, E. J. W.—Housings for electrical transformers. 10th November, 1954. (760414.)

5326. Metropolitan-Vickers Electrical Co., Ltd.—Novelty devices such as for advertising, display, instructional and like purposes. 23rd February, 1955. (760255.)

5913. Philips Electrical Industries, Ltd.—Devices for modulating and/or amplifying electric signals. 1st March, 1954. (760141.)

6359. Igranic Electric Co., Ltd.—Mechanical interlocks for electrical apparatus. 4th March, 1954. (760142.)

6377. Philips Electrical Industries, Ltd.—Methods of electric arc-welding. 4th March, 1954. (760258.)

6691. Mullard Radio Valve Co., Ltd.—Electric inductance coils. 8th March, 1954. (760143.)

6700. Fernseh Ges.—Television apparatus. 8th March, 1954. (760416.)

7586. English Electric Co., Ltd.—Electrical resistors. 11th March, 1955. (760505.)

7612. Standard Telephones & Cables, Ltd.—Intelligence storage devices. 11th March, 1955. (760048.)

7639. Gratzmuller, J. L.—Electric circuit-breaker. 16th March, 1954. (760146.)

7765. Reyrolle & Co., Ltd., A.—Gas-blast electric circuit-breakers. 17th June, 1955. (760355.)

7815. Fortiphone, Ltd.—Miniature electric transformers and chokes. 16th March, 1955. (760421.)

8265. Westinghouse Brake & Signal Co., Ltd., and Wheatley, J. D.—Voltage regulators. 4th February, 1955. (760506.)

8655. National Research Development Corporation.—Waveguide power measurement. 11th March, 1955. (760356.)

9425. Stern, W. L.—Power factor control apparatus. 14th June, 1955. (Cognate application 9427, 31st March, 1954.) (760264.)

11008. Short Bros. & Harland, Ltd.—Electric motors. 13th April, 1955. (760269.)

11444. Standard Telephones & Cables, Ltd.—Loading coil case. 15th April, 1955. (760514.)

11448. Westinghouse Electric International Co.—A.c. electrical measuring instruments. 21st April, 1954. (760515.)

11538. Akt.-Ges. Brown, Boveri & Cie.—Photo-electric selvedge control device. 21st April, 1954. (760424.)

11572. Westool, Ltd., and Hook, G. R.—High temperature magnet coil. 11th May, 1955. (760060.)

11689. General Electric Co., Ltd., and Fitzpatrick, J. A.—Electric protective arrangements. 22nd April, 1955. (760358.)

11699. British Thomson-Houston Co., Ltd.—Motion picture projection apparatus. 21st April, 1955. (760359.)

11795. English Electric Co., Ltd.—Electro-hydraulic devices. 22nd July, 1955. (Addition to 720468.) (760516.)

11797. English Electric Co., Ltd.—Pantograph type current collectors for electrically-driven vehicles. 25th April, 1955. (760425.)

12026. British Oxygen Co., Ltd.—Cutting by electric arc of metals and alloys. 26th April, 1955. (760270.)

12527. Hodgkinson (Salford), Ltd., J.—Electric switches adapted for periodic interruption. 2nd May, 1955. (760271.)

12978. Bosch, F. J. G. Van Den, and Pingen, G. J. L.—Electro-optical apparatus. 4th May, 1954. (760523.)

17539. Licentia Patent-Verwaltungs-Ges.—High voltage isolating switch. 15th June, 1954. (760435.)

17865. Télémécanique Eléctrique.—Arrangement for allowing an electrical apparatus to be connected in series in or disconnected from an electric circuit without thereby breaking said circuit. 17th June, 1954. (760167.)

18018. Tanaka, I., Asakura, M., and Hara, M.—Apparatus applicable to the comparison of the gains of electrical amplifying devices. 18th June, 1954. (760436.)

18192. Decca Record Co., Ltd.—Computers for use in connection with radio navigation systems. 21st June, 1955. (760528.)

18285. Western Electric Co., Inc.—Electrical switching circuits which derive pulses from changes of state of a magnetic core. 22nd June, 1954. (760437.)

19941. Beatty Bros., Ltd.—Washing machines for clothes and the like. 7th July, 1954. (Addition to 735217.) (760172.)

20938. Reekie, R. B.—Thermostatically controlled steam traps and/or reducing valves. 19th July, 1954. (760531.)

21885. International Business Machines Corporation.—Magnetic core logical circuits. 27th July, 1954. (760175.)

22280. Allday & Son (1922), Ltd., H.—Electric cable cleats. 25th July, 1955. (760533.)

22918. Standard Telephones & Cables, Ltd.—Electric discharge devices. 6th August, 1954. (760536.)

23259. Steen, C. A.—Electric steam boilers. 10th August, 1954. (760182.)

24466. Belling & Lee, Ltd.—Aerial arrangement. 31st May, 1955. (760183.)

24665. Commonwealth Scientific & Industrial Research Organisation.—Vacuum tube gates and gating circuits. 24th August, 1954. (760540.)

24731. Philips Electrical Industries, Ltd.—Devices for X-ray analysis. 25th August, 1954. (760448.)

25616. Philips Electrical Industries, Ltd.—Indicating devices for obtaining the representation of a frequency curve. 3rd September, 1954. (760541.)

25708. Bristol Co.—Electrical bridge networks. 4th September, 1954. (760542.)

[*Continued at foot of page* 805

NEXT WEEK'S EVENTS

Organisers of electrical functions are advised to make use of the "Electrical Review" clearing house, Room 221, Dorset House, Stamford Street, London, S.E.1, to ascertain that proposed dates for their functions do not clash with others already arranged.

Monday, 29th October

BIRMINGHAM.—James Watt Institute, Great Charles Street, 6 p.m. I.E.E. South Midland Radio & Telecommunication Group. "Stereosonic Recording and Reproduction," by H. A. M. Clark.

CHESTER.—Town Hall, 6.30 p.m. I.E.E. Mersey & North Wales Centre. "Domestic Heat Pump Installations," by G. O. McLean.

HULL.—Y.E.B., Ferensway, 7 p.m. I.E.S. Leeds Centre. "Problems of Shop and Store Lighting," by K. C. White.

MANCHESTER. — Engineers' Club, Albert Square, 7 p.m. I.E.E. North-Western Graduate & Student Section. "Forum."

NEWCASTLE-UPON-TYNE. — King's College, 6.15 p.m. I.E.E. North-Eastern Radio & Measurements Group. "The Instrumentation of a 14-inch Experimental Rolling Mill," by S. S. Carlisle and G. W. Alderton.

WORCESTER.—Sports Club, Hilton Road, 6 p.m. I.E.E. South Midland Centre district Section. "Automation and its Social and Economic Implications," by L. Landon Goodman.

Monday, 29th October, to Friday, 2nd November

LONDON.—Savoy Place, W.C.2. I.E.E. Radio and Measurement Sections. Convention on Ferrites.

Tuesday, 30th October

COVENTRY. — Methodist Central Hall, Warwick Lane, 7 p.m. I.E.E. South Midland Graduate & Student Section. "Introduction to Low Frequency Feedback Amplifier Design," by Mrs. R. E. West.

LEEDS.—The University, 6.30 p.m. I.E.E. North Midland Education Discussion Circle. Discussion on "The Teaching of High Voltage Testing," opened by Dr. D. A. Jones.

LONDON.—25, Foubert's Place, W.1, 2.30 p.m. Electrical Association for Women, London Branch. Discussion on "Our Changing Homes," opened by Mrs. J. M. Scott.

Manson House, Portland Place, W.1, 6.30 for 7 p.m. Society of Instrument Technology, London Section. "Control Engineering and the Automatic Process Plant," by D. S. Townend.

POOL-IN-WHARFEDALE. — I.E.E. North Midland Graduate & Student Section. Visit to B. S. & W. Whiteley, Ltd., at 7 p.m.

Wednesday, 31st October

CARDIFF.—College of Technology and Commerce, Cathays Park, 6.30 p.m. British Institution of Radio Engineers, South Wales Section. Annual general meeting, followed by "Applications of Transistors to Radio Reception," by L. E. Jansson.

GLASGOW.—39, Elmbank Crescent, 7 p.m. I.E.E. South-West Scotland Sub-Centre. "Age and the Incidence of Fires in Electrical Installations," by L. Gosland.

HOVE.—New Imperial Hotel, First Avenue, 7.30 p.m. A.S.E.E. Brighton, Hove & District Branch. "New Light Sources," by G. V. McNeill.

LONDON.—School of Hygiene & Tropical Medicine, Keppel Street, 6 p.m. British Institution of Radio Engineers, London Section. Annual general meeting, followed at 7.15 p.m. by presidential address, by G. A. Marriott.

Connaught Rooms, Great Queen Street, W.C.2, 12.30 for 12.55 p.m. Batti-Wallahs' Society. Luncheon. Guest speaker, Sir Archibald Gordon.

At the Royal Society of Arts, John Adam Street, W.C.2, 7.15 p.m. British Kinematograph Society. "Electronic Motion Picture Production for Television," by W. Kemp.

MIDDLESBROUGH. — Cleveland Scientific & Technical Institute, Corporation Road, 6.30 p.m. I.E.E. Tees-Side Graduate & Student Section. Film show.

NOTTINGHAM.—College of Arts & Crafts, Waverley Street, 7.30 p.m. Institution of Heating and Ventilating Engineers, East Midland Branch. "The Practical Application of Air Conditioning in Industry," by L. G. W. Gosden. (Joint meeting with the Institution of Mechanical Engineers.)

At the Mechanics' Institution, Trinity Square, 7.15 p.m. A.S.E.E. Nottingham Branch. Visit of the general secretary. Film, "The 1956 Electrical Engineers' Exhibition."

RUGBY.—College of Technology & Arts, 6.30 p.m. I.E.E. Rugby Graduate & Student Section. "The Emergence of the Student into the Professional Engineer," by Prof. E. B. Moullin.

YORK.—A.S.E.E. York Branch. Visit to Fire Brigade Headquarters.

Wednesday, 31st October, to Friday, 2nd November

LONDON.—Institute of Welding. Autumn meeting. Annual dinner (31st October) at Park Lane Hotel, W.1. Technical sessions at the Institutions of Civil and Mechanical Engineers (1st November) and at the Institution of Civil Engineers (2nd November).

Thursday, 1st November

CROYDON.—Half Moon Hotel, Broad Green, 8 p.m. A.S.E.E. South London Branch. "Power Factor Correction," by J. R. Arthur.

GLASGOW.—39, Elmbank Crescent, 6.30 p.m. I.E.S. Glasgow Centre. "Design To-day," by A. Maynard.

LINCOLN.—Ruston Club, 7 for 7.30 p.m. Institution of Production Engineers, Lincoln Section. Annual dinner-dance.

MALVERN.—Winter Gardens, 7 p.m. British Institution of Radio Engineers, South Midlands Section. "Principles of the Light Amplifier and Allied Devices," by Dr. T. B. Tomlinson.

MANCHESTER. — College of Technology, Sackville Street, 6.30 p.m. British Institution of Radio Engineers, North Western Section. "Electronics Applied to Physiology," by H. W. Shipton.

NOTTINGHAM.—Victoria Hotel, 6.30 for 7 p.m. Incorporated Plant Engineers, East Midlands Branch. Ladies' evening.

Electricity Service Centre, Smithy Row, 5.30 for 6 p.m. I.E.S. Nottingham Centre. "Road Vehicle Lighting," by J. H. Nelson.

TAUNTON.—Electricity House, 7 p.m. I.E.E. Bristol Graduate & Student Section. "Some Methods of Investigating Surge Phenomena," by A. H. Scott.

Friday, 2nd November

CHELTENHAM.—Queen's Hotel, 8 p.m. to 1 a.m. E.I.B.A. Gloucestershire Branch. Annual ball.

GILLINGHAM. — Central Hotel, Watling Street. Incorporated Plant Engineers, Kent Branch. Annual dinner and dance.

LIVERPOOL.—9, The Temple, 24, Dale Street, 7.30 p.m. A.S.E.E. Liverpool Branch. "Modern Railway Signalling," by J. Sulston.

LONDON.—Grosvenor House, W., 6.30 for 7 p.m. Electrical Contractors' Association, London Branch. Annual dinner and dance.

Saturday, 3rd November

LIVERPOOL.—Bradford Hotel. A.S.E.E. Liverpool Branch. Annual dinner.

LONDON. — Victoria Halls, Bloomsbury Square, W.C.1, 7.30 p.m. I.E.E. London Graduate & Student Section. Joint dance with the Graduate & Student Sections of the I.C.E. and I.Mech.E.

OXFORD.—The George. A.S.E.E. Oxford, Reading & Districts Branch. Annual dinner.

NEW PATENTS (*Continued from page 804*)

26088. Union Carbide & Carbon Corporation.—Furnace electrode joint. 9th September, 1954. (760187). 26089. Graphite electrodes for electrolytic cells. 9th September, 1954. (760288.)

26201. Siemens & Halske Akt.-Ges.—Supervisory arrangements for electric multistable state switching devices. 9th September, 1954. (760450.)

28244. General Electric Co.—Electric width gauge apparatus. 30th September, 1954. (760190.)

30158. Standard Telephones & Cables, Ltd. (Lorenz Akt.-Ges., C.).—Arrangements for actuating the contact springs of an electromagnetic relay. 20th October, 1954. (760376.)

30493. Link Aviation, Inc.—Null balance electrical measuring systems. 22nd October, 1954. (760455.)

31510. Philips Electrical Industries, Ltd.—Equalising networks. 1st November, 1954. (760555.)

32419. General Electric Co.—Magnetic cores for electric induction apparatus. 9th November, 1954. (760300.)

33012. Metz, P.—Portable broadcast receiver. 15th November, 1954. (760197.)

34061. Western Electric Co., Inc.—Semiconductor translating devices. 24th November, 1954. (760563.)

33971. Vacuumschmelze Akt.-Ges.—Processes for the production of an electrically insulating layer on metals and alloys. 23rd November, 1954. (760199.)

34216. Hazeltine Corporation.—Transistor circuit for generating linear sweep signals. 25th November, 1954. (760461.)

35808/9. Teletype Corporation.—Telegraph transmitter. 10th December, 1954. (760565/6.)

36426. Soc. des Brevets Wagner.—Electric machine having a rotating tool. 16th December, 1954. (760207.)

36508. Electro-Magnetic Products, Ltd.—Electric fence units. 16th December, 1954. (760466.)

36903. Western Electric Co., Inc.—Microwave transmission systems. 21st December, 1954. (760467.)

37397. Western Electric Co., Inc.—Electrical information storage circuits and devices. 24th December, 1954. (760307.)

1955

19363, 19376 and 36067. Decca Record Co., Ltd.—Microwave apparatus. 24th December, 1953. (Divided out of 760317). (760386/7/9.)

19441. Decca Record Co., Ltd.—Radio antennæ. 24th December, 1953. (Divided out of 760317.) (760388.)

REITH LECTURES

This year's Reith Lectures are to be given by Sir Edward Appleton, G.B.E., K.C.B., D.Sc., LL.D., F.R.S., Nobel Laureate, principal and vice-chancellor of the University of Edinburgh. His lectures, on "Science and the Nation," will be broadcast in the Home Service on six Sundays, starting on 11th November.

CONTRACT INFORMATION

Accepted Tenders and Prospective Electrical Work

CONTRACTS OPEN

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses.

Australia.—7th December. Brisbane City Council. Eight 7,500 kVA step-down outdoor type transformers. (E.S.B. 25715/56. Ten/22057.)*

26th November. Electricity Commission of New South Wales. 33 kV metalclad switchgear for Pyrmont "B" power station. (E.S.B. 26255/56. Ten/22112.)*

Berkhamsted.—6th November. U.D.C. Sodium lighting installation, High Street. R. E. Hulse, engineer, Civic Centre.

Brazil.—28th November. Companhia de Eletricidade de Manaus. Equipment for a hydro-electric power station including three 7,500 kW turbo-generating sets, boilers, switchboards, service substations, etc. (E.S.B. 25046/56. Ten/22067.)*

Brentwood.—12th November. U.D.C. Class "A" lighting, London-Great Yarmouth Road. (See this issue.)

Burma.—6th November. Union Purchase Board. Batteries for aircraft. (E.S.B. 25534/56. Ten/22034.)*

Chippenham.—27th November. Wilts C.C. Electrical installation in boys' secondary modern school. (See this issue.)

Edinburgh.—North of Scotland Hydro-Electric Board. Electric lighting, heating, and main and auxiliary cabling for Glascarnoch and Vaich dams and power station. (See this issue.)

Formosa.—10th December. Central Trust of China. Three power transformers and spare parts. (E.S.B. 25843/56.I.C.A. Ten/21977.)*

Greece.—2nd November. State Procurements Service, Ministry of Finance. Lead storage batteries, boxes and tops. (E.S.B. 26592/56. Ten/22149.)*

India.—12th November. Government of Mysore. Control panels, relays, meters, etc., for two 110 kV transmission lines. (E.S.B. 25585/56. Ten/22096.)*

20th November. Government of Travancore-Cochin. Copper conductors. (E.S.B. 26372/56. Ten/22100.)*

Irish Republic.—6th November. Dublin Board of Assistance. Electrical installation in the new dispensary, Collins Avenue, Finglas. (E.S.B. 26220/56. Ten/22063.)*

Longbenton (Northumberland). — 5th November. U.D.C. Supply and erection of 20 sodium vapour lighting units in Salters Lane. Surveyor, Council Offices, Forest Hall, Newcastle-on-Tyne.

New Zealand.—3rd December. General Post Office. Radio valves. (E.S.B. 25903/56. Ten/21982.)*

Northern Ireland.—27th November. Electricity Board for Northern Ireland. Two 37·5 MVA transformers for Coolkeragh power station, Londonderry. (See this issue.)

Philippines.—5th November. National Power Corporation. 69 kV load end substation equipment and accessories. (E.S.B. 26459/56. Ten/22108.)* 29th November. Hydro-electric power station equipment including four 27,800 kVA generators, turbines, butterfly valves and air-pressure governors. (E.S.B. 26365/56. Ten/22113.)*

Rhodesia and Nyasaland.—7th November. City of Bulawayo. 120 sodium street lighting fittings, lamps and control gear. (E.S.B. 26266/56. Ten/22090.)*

South Africa.—7th November. Stores Department, South African Railways. Electric heat treatment furnace. (E.S.B. 26286/56. Ten/22044.)* 16th November. 6,200 insulators. (E.S.B. 26285/56. Ten/22047.)*

8th November. Union Tender and Supplies Board. Telephone small parts. (E.S.B. 25972/56. Ten/21997.)*

Staines.—9th November. U.D.C. Street lighting equipment for Convent Road and Town Tree Road. Surveyor, 240, London Road.

Stourbridge.—3rd November. B.C. Street lighting equipment. G. N. Maynard, borough engineer, The Council House.

Syria.—18th November. Municipality of Latakia. Armoured cable. (E.S.B. 26338/56. Ten/22095.)*

Tottenham.—30th November. B.C. Electric lamps (schedule 5), for the year commencing 1st April, 1957. M. Lindsay Taylor, town clerk, Town Hall, N.15.

Turkey.—4th November. Ministry of Foreign Affairs. Underground h.f. and v.f. cables. (E.S.B. 26871/56. Ten/22154.)*

United States.—8th November. Mobile District Corps of Engineers, Alabama. Four 45,500 h.p. hydraulic turbines. (E.S.B. 26104/56. Ten/22163.)*

8th November. Bureau of Reclamation, Colorado. 4,000 kVA power transformer. (E.S.B. 26704/56. Ten/22162.)* 15th November. Two power circuit-breakers for Sioux City substation. (E.S.B. 26147/56. Ten/22158.)*

Upholland.—12th November. U.D.C. Electrical installations, including electric cookers, in 12 houses on the Highgate estate. Surveyor, Council Offices, Upholland, near Wigan.

Uruguay.—9th November. Administracion de Ferrocarriles del Estado. Telegraphic apparatus. (E.S.B. 26236/56. Ten/22085.)*

28th November. Administracion General de las Usinas Electricas y los Telefonos del Estado. Lead covered telephone cables. (E.S.B. 25645/56. Ten/21979.)*

Wanstead and Woodford.—20th November. Borough Council. Street lighting equipment. (See this issue.)

West Riding.—5th November. C.C. Rewiring of the electrical installation in Great Houghton C.E. Controlled School. County architect, Bishopgarth, Westfield Road, Wakefield.

Willesden.—14th November. Borough Council. Group "A" lighting, Edgware Road. (See this issue.)

ORDERS PLACED

Durham.—County Education Committee. Electrical work at Auckland Girls' Grammar School (£4,548).—R. V. Hogg and Co.

Newcastle-on-Tyne. — Regional Hospital Board. Telephone equipment at new additions to St. George's Hospital, Morpeth (£1,076).—Reliance Telephone Co. External electrical services in connection with the erection of a new hospital at Homewood, West Cumberland (£5,945).—F. H. Wheeler & Co.

WORK IN PROSPECT

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Abernant.—Pithead baths (£150,000), for National Coal Board; staff architect, Cambrian Buildings, Mount Stuart Square, Cardiff.

Ashington.—Pithead baths, canteen, offices, and screening plant for Northern Coal Board, Whitley Road, Longbenton; own architects.

Aylesbury.—Dwellings (161), Weedon Road estate; borough surveyor.

Barry.—Shops and maisonnettes (20), Winston Road; Stephen Thomas, architect, 26, Commercial Street, Newport, Mon.

Bath.—Bus station, Manvers Street, for Bristol Tramways & Carriage Co., Ltd.; Stone & Co., Ltd., builders, 140, Redland Road, Bristol.

Boreham Wood.—R.C. church; Sterrett & Blouet, architects, 7, Ashley Place, London, S.W.1.

Bristol.—Offices on site of 23-24, Queen Square; Hosegood Industries, Ltd., millers, 22, Queen Square.

Canterbury.—Phase 2 of reinstatement of St. Martin's Hospital; architect to the South East Metropolitan Regional Hospital Board, 9, Hallam Street, London, W.1.

Chatteris.—Houses (50), Badgeney Road estate and bungalows (26) on New Road site; U.D.C. architect, Chatteris, Cambs.

Clitheroe.—Workshops, stores, garages, etc., in Chester Avenue (£25,000); borough surveyor, Church Street.

Croydon.—Flats (60), North Downs Crescent and North Downs Road, New Addington, and flats (18) in Vermont/Highview Road, Upper Norwood; E. Taberner, town clerk.

Doncaster. — Two primary schools (£118,049) and secondary modern school at Cantley (£148,104); borough architect.

Eastbourne.—Flats (62), Langney Village; Wm. Ellis, Ltd., builders, High Street, Etchingham.

Gateshead.—Municipal restaurant in Saltwell Park (£16,000) and secondary school at Hill Heads; G. S. Winters, borough surveyor.

Goole.—Factory, Rawcliffe Road; Versil, Ltd., insulation contractors, Raynor Mills, Liversedge.

Hastings.—Houses (134), Down Farm estate, Ore; borough surveyor, 37, Wellington Square.

Iver Heath.—Dwellings (126), Bangors Road North; G. W. Froggatt, surveyor, Windsor Road, Slough.

Leicester.—Extensions to Wyggeston Boys' School (£60,000); city architect.

London.—Offices, Plough Place, City; Knapton & Deane, architects, 123, Newgate Street, E.C.1.

Departmental store, Tivoli Theatre site, Strand; Peter Robinson, Oxford Circus, W.1.

Rebuilding Middlesex Hospital Medical School, Mortimer Street, W.1.

Long Eaton.—Houses (174) at Sawley for U.D.C.; F. Perks & Son, Ltd., building contractors, Bridge Street.

Maidstone.—Two-storey extensions to factory; Len Cabinet Works, Ltd., Water Lane.

Nuneaton.—Warehouse and offices, Camp Hill; Alfred Conner & Co., Ltd., Fife Street.

Portsmouth.—Houses (138), Parkhouse Farm site, Leigh Park; city architect.

Ramsbottom. — Rebuilding dye works (£40,000); T. Robinson & Co., Ltd., dyers, Hope Works.

Romford.—Church, Hardleigh Green Road, Squirrels Heath; Tooley & Foster, architects, Midland Bank Chambers, Buckhurst Hill.

Houses (172), Winletye Lane, Hornchurch; D. A. Moody & Co., Ltd., 178, Brentwood Road.

St. Leonards-on-Sea.—Factory, Ponswood; Holliday & Greenwood, Ltd., builders, 11, Buckingham Palace Gardens, London, S.W.1.

Scunthorpe.—Factory, Scotter Road; North Lincolnshire Pre-packers, Ltd., 24, Glanville Avenue.

Office block, Queensway; Orthostyle, Ltd., engineers, Ashby Ville Road.

South Shields.—Church, hall, and vicarage, Galsworthy Road; Cordingley and McIntyre, architects, Owengate, Durham City.

Worksop.—Factory; J. E. Smith (Worksop), Ltd., builders, Kilton Road.

* Specifications may be inspected at the Export Services Branch, Board of Trade, Lacon House, Theobald's Road, London, W.C.1 (Chancery 4411; extension 769).